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# THE PRODUCTION AND TECHNOLOGICAL CHARACTERISTICS OF SOME LINES OF PEPPER VARIETY KURTOVSKA KAPIJA IN THE REGION OF STRUMICA

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## Abstract

With the long-term production of pepper variety kurtovska kapija, some biological degeneration has appeared. In the Agricultural Institute of Strumica work has continued on the individual breeding of 798 lines of pepper from several regions of the Rep. of Macedonia. Lines S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> from Strumica and lines R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> ..... R<sub>9</sub> from the Radovis region were taken. Their vegetative period lasted over 141 days.

The largest values concerning fruit length, compared with the standard, were found with the lines R<sub>1</sub> and R<sub>2</sub> (13,8 cm). The largest values in fruit width and weight, compared with the standard, were found with line R<sub>9</sub> (5,5 cm /74,2 g). The yield obtained from line R<sub>9</sub> was the largest (39.149 kg/ha). Knowing the importance of pepper kurtovska kapija in vegetable production, and knowing the needs of the food processing industry in the Rep. of Macedonia, we can say that the lines of these peppers will soon find a place in our vegetable production.

## 1. Introduction

The pepper kurtovska kapija is important in vegetable production. The demands of modern production and consumption require that the selection of the pepper kurtovska kapija should be directed towards creating lines with stable morphological and production characteristics.

Yield is the most important characteristic in the ennobling of the plant. In its function, all the other objects for ennobling of the particular characteristics can be found. It is also a quantitative characteristic controlled by a large number of genes under strong influence of the ecological circumstances. The main aspects in increasing the yield of the pepper are fruit mass and the number of fruits per plant (Betlach, 1967). According to Popova (1966), the fruit mass in the large fruit pepper sort is between 40 - 150 g (Jankulovski, 1983).

Besides yield, the other main characteristic in the ennobling is the duration of vegetation, according to which all pepper sorts can be divided into three groups: early varieties till 120 days, middle early (121 - 140 days) and late varieties till 141 days (Jankulovski, 1983). The aim of the research is to examine the yield and its components as well as the duration of vegetation with particular lines of the pepper - kurtovska kapija.

## 2. Material and methods

The creation of new pepper lines is a result of the continuing work in the Agricultural Institute of Strumica. The lines (S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>) from Strumica and the lines (R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, ..... R<sub>9</sub>) from Radovis area were separated. The experiment was done in 1993 - 1994, and was set

using a circumstantial block system in four repetitions. The experimental material was planted during the optimal period on alluvial soil. During the vegetation, the crops were breaded, watered and dug, in order to exterminate weeds. All the necessary measures were taken in the phase of physiological maturity.

### 3. Results and Discussion

The results of the research show that the examined lines where the seeding was performed in a cold vegetable patch have a period of 21 days, from seeding to sprouting (table 1).

Table 1 - Length of vegetation period of pepper.

(Strain)	(P - S)*	(S - F)*	(S - T)*	(S - Ph)*
S1	21	89	144	161
S2	21	90	144	158
S3	21	89	142	157
R1	21	89	143	158
R2	21	89	144	159
R3	21	89	143	158
R4	21	91	144	159
R5	21	89	144	158
R6	21	90	144	158
R7	21	92	144	160
R8	21	90	145	160
R9	21	93	145	159
Kurtovska kapija ø	21	89	144	158

(P - S) - Planting - Sprouting ; (S - T) - Sprouting - Technological ripeness  
(S - F) - Sprouting - Flowering ; (S - Ph) - Sprouting - Physiological ripeness

The second developmental phase of pepper, from sprouting to flowering, lasted approximately 89 - 93 days. The two-year long research showed a small variety in the duration of this period

The phase from sprouting to technological maturity was the shortest in line S<sub>3</sub> (142 days), and the longest in the lines R<sub>8</sub> and R<sub>9</sub> (145 days). This characteristic is especially important in the production of pepper for fresh consumption.

The duration of vegetation period from the sprouting to physiological maturity was between 157 and 161 days.

Measuring the fruit from the base to the top, we get the length of the fruit. It is shown in table 2, and the shortest length is found in lines R<sub>3</sub> - 11,9 cm, and the longest length in lines R<sub>1</sub> and R<sub>2</sub> - 13,8 cm.

Table 2 - Morphological characteristics of pepper fruit.

(Strain)	Length of fruit (cm)	Width of fruit (cm)	Pericarp thickness (mm)	Weight of fruit (g)
S1	12,7	5,4	5,0	73,8
S2	13,5	5,3	5,0	72,8
S3	12,6	5,5	4,9	73,4
R1	13,8	5,4	5,0	68,0
R2	13,8	5,4	5,3	69,0
R3	11,9	5,5	4,8	69,0
R4	12,8	5,2	5,2	67,4
R5	12,5	4,9	5,4	61,0
R6	13,3	5,4	5,2	76,6
R7	12,9	5,3	4,9	73,4
R8	12,4	5,0	5,1	65,6
R9	13,4	5,5	5,4	74,2
Kurtovska kapija ø	12,6	5,2	4,9	69,3
Average	12,9	5,3	5,1	70,3

The widest fruit was from the lines S<sub>4</sub>, R<sub>3</sub>, R<sub>9</sub> - 5,5 cm. and the shortest one from the line R<sub>5</sub> - 4,9 cm.

The thickness of the pericarp is one of the most important characteristics which influence the yield. The pericarp with smaller thickness than the standard (14,9 mm) was seen in the line R<sub>4</sub> (4,8 mm). The largest was measured in lines R<sub>3</sub> and R<sub>9</sub> (5,4 mm).

The fruit mass varies from case to case and depends on many circumstances which influence the growth and development of the pepper. Compared with the other characteristics, this one depends more on climate and soil conditions.

The largest average fruit weight in relation with the standard was seen in the line R<sub>6</sub> - 76,6 g. When we know that the potential and the fertility of one sort depends on this characteristic, then it is normal to expect a higher yield from these lines.

Significant differences among the lines in fruit length, width, thickness of pericarp and mass were not found. The yield of physiologically matured fruits per square unit depends on the number and the weight of the standard fruits.

If we compare the average yields in both years, we can see that between the lines there are certain differences (table 3). The yield obtained in 1994 was larger than that one in 1993 in all lines. This leads to the conclusion that the year 1994 was better for pepper production. In any case, the difference was not significant.

Table 3 - Yield of the fruit (kg/ha)

(Strain)	<u>y e a r</u>				
	1993	%	1994	%	(Average)
S1	31.373	110,0	39.200	108,5	35.286
S2	33.214	116,5	41.639	115,3	37.426
S3	34.547	121,2	36.153	100,1	35.350
R1	31.683	111,1	36.750	101,7	34.216
R2	28.174	98,8	36.596	101,3	32.385
R3	29.690	104,1	37.607	104,1	33.648
R4	26.286	92,2	36.928	102,2	31.607
R5	23.373	82,0	42.600	117,9	32.986
R6	26.524	93,0	35.446	98,1	30.985
R7	28.905	101,4	39.446	109,2	34.175
R8	27.428	96,2	38.392	106,3	32.910
R9	37.048	129,9	41.250	114,2	39.149
Kurtovska kapija Ø	28.500	100,00	36.107	100,00	32.303
Average	29.749	—	38.316	—	34.032

#### 4. Concluding Remarks

On the basis of our two-year long study we can conclude:

- According to the duration of the vegetation period, the newly created lines of pepper kurtovska kapija could be classified with the late sorts with the duration of the vegetation over 141 days.
- The longest fruits, compared to the standard, were obtained from the lines R<sub>1</sub> and R<sub>2</sub> - 13,8 cm.
- The width of the fruit, compared to the standard, is larger in the lines S<sub>3</sub>, R<sub>3</sub> and R<sub>9</sub> - 5,5 cm.
- Lines R<sub>6</sub> and R<sub>9</sub> had fruits with the greatest weight, 74,2 g R<sub>9</sub>, and the line R<sub>6</sub> 76,6 g.
- Largest yield was obtained by line R<sub>9</sub> - 39.149 kg/ha and by the line S<sub>2</sub> - 37. 426 kg/ha.
- Knowing the importance of pepper kurtovska kapija in vegetable production and knowing the needs of the food processing industry in the Rep. of Macedonia, we can say that the lines of these peppers will soon find the place in our vegetable production.

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