THE IMPACT OF THE NUMBER OF BLOOMED FLOWERS IN EARLY MATURITY, PRODUCTIVITY AND PRODUCTION QUALITY OF THE TOMATO CULTIVAR JAGUAR F1

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Abstract*: Tomato is one of the most important and most distributed vegetable crops in Kosovo that is being cultivated each year in an area over 2000ha, with little oscillation throughout years. The tomato cultivar Jaguar was used in our study while the investigation was performed in tomatoes cultivated in four variants (six, eight, ten and twelve levels of plant growth-floors). During our investigation there were monitored and analyzed phonological data, biometric indicators of plant and fruits, bloomed (opened) flowers and fruits formed, earliness indicators of the variants, yield according to the harvesting period, dynamic of the production and economic evaluation in conditions of sun greenhouses in Anadrini region, Kosovo. The experiment has been set up according to randomized block design in four replication. The investigated parameters were: plant height in cm, the height of the first level (first floor) from soil surface, stem width in cm, average fruit weight, the number of bloomed flowers and fruits formed, early maturity, indicators of the variants in production. The plant height in cm of the variants was from 155cm at first growth level (first floor) to 253 cm at fourth growth level. The number of bloomed flowers at first floor was 94.44%, to the forth variant (floor) was 92.84%, while as for other variants it was between these two values. The height of the first floor was in range from 25.50 to 27.50cm for first and fourth floor respectively, whereas for other floors it was between these values. The average weight of fruits resulted to be within ranges from 187.54 to 169.58gr for first respectively fourth floor, whereas for other floors it was between these values. Stem width resulted to be within ranges 1.53-1.35cm, values shown at first and fourth floor while other floors were within these values.*

Key words: *Tomato, earliness indicators, bloomed flowers, production.*

INTRODUCTION

Tomato is one of the most important and profitable vegetable crops in Kosovo. It is planted in the area over 2000 ha. Larger areas include solar greenhouses, where it is made our study. Protected environments (greenhouses) are one of the most active forms of human activities in agriculture, taken into account the financial investment and human technologies addressed by it. Solar greenhouses also enable accelerated growth of plants, their productivity use through the control of agronomic practices, where the goal is to optimize the ground and climate indicators with biological requirements of plants.

By unknowing the impact of the number of bloomed flowers on the quality and productivity we decided to investigate some of their characteristics such as biometric indicators of plants, bloomed flowers and fruits formed, production dynamics, general productivity and economic assessment etc. Today the areas with protected environments (greenhouses) are expanding rapidly even in Kosovo, which has around 3000 ha with tunnels and greenhouses (LUSHI, 2009). It is estimated that worldwide are used about 2 million ha of protected environments.

MATERIAL AND METHODS

In this study it is taken the tomato hybrid Jaguar originated by Netherlands and is

planted in solar greenhouse in Anadrini region in Rahovec. The applied planting distances were 100 x 40 cm and with a planting density of the plants 2.5 plant/m2. For this research it is used the Jaguar hybrid, and totally were taken four variants: the first variant with 6 bloomed flowers, the second variant with 8 bloomed flowers, third variant with 10 bloomed flowers and the fourth one with 12 bloomed flowers. Seeds were planted on 26 of January for three years of research. While saplings were planted in the greenhouse after 60 days, also for these three years (2008, 2009, 2010).The scheme of planting experiments was that of randomized blocks in four repetitions. The size of each repetition was 25m2. During these investigations the following indicators have been followed and analyzed: the date of planting seeds, germination date, date planting in greenhouse, budding date, date of blooming according to bummed flower, date of the fruits formed, percentage of fruits formed, the date of full-grown fruits, etc. By biometric indicators of plant and fruit was researched the highness of the plant, the highness of first floor, the thickness of main stem in three points, the average fruit weight in g, while from the indicators of chemical composition of fruit, dry matter, overall acidity, percentage (%) of sugar and pH factor.

Jaguar-F1. Is an indeterminate hybrid of early maturity with high development of vegetative mass. The fruits are flat round-shaped, they are vigorous and the fruit colour is intensive red. It is convenient for transportation, with the average weight of the fruits 179.33 g, average weight per plant 7.29 kg, with a productivity 1821.28 qu / ha. It is resistant to diseases and pests.

RESULTS AND DISCUSSION

Ripped tomatoes are harvested and weighed for each experimental unit in accordance with the six periods of time in totally 28 harvests.

Biometric indicators of plant

The highness of the plant measured before cutting the tip of the plant, resulting in the limits from 155 cm (6 bloomed flower) to 253.cm (12 bloomed flower), while the first floor heightens from the ground resulting in limits from 23.5 to 27.5 cm that are founded to the 8 and 12 bloomed flower. The distance between the third and fourth bloomed flower resulting with the limits 23.5 to 26.5 cm. The thickness of the stem results in thelimits1.25to1:53cm.

Biometric indicators of fruit

For the indicators of fruit we can distinguish: H-D Report which is connected to the shape of the fruit in which case we can see that its value is in the limits 0.70-0.85. Even in the number of cubicles, the shown differences are small. So the numbers of cubicles for all variants taken in the study are in the values 3.5 to 5.0 where is shown a positive correlation in relation with the number of cubicles and average weight of fruits. Regarding the thickness of epikarp it is shown that the values of this indicator are in the limits of 0:45 - 0.65 mm, it appears that the differences between the hybrids are evident. In terms of average fruit weight, we can see a difference between the variants, so the highest weight is highlighted to the first variant respectively with 6 bloomed flowers (187.54 g), whereas the lowest one to the fourth variant, respectively with 12 bloomed flowers (169.58 g).

Bloomed flowers and fruits formed

Table 1.

Bloomed flowers and fruits formed of Jaguar hybrid

Deadline	Number of Bloomed flowers	Number of fruits formed	% of fruits formed versus Bloomed flowers
6- Bloomed flowers	894	844	94.44%
8- Bloomed flowers	876	820	93.61%
10- Bloomed flowers	865	805	93.06%
12- Bloomed flowers	810	752	92.84%

From table 1 we conclude that the highest percentage of fruit formed is to the first variant with six bloomed flowers, respectively (94.44%), and then to the second variant respectively third one. The lower fruit formed versus bloomed flowers is noticed in the fourth variant (92.84%).

Economic Assessment

Table 2.

Economic assessment to the Jaguar hybrid

Harvest period	Variant	Quantity kg	Price (Euro)	Value (Euro)	Ton/ha	Euro
05/06-16/06	V 1	15.90	0.80	12720		
	V 2	12.07	0.80	9656		
	V 3	8.78	0.80	7024		
	V 4	19.15	0.80	15320		
16/06-30/06	V 1	55.47	0.63	34946		
	V 2	55.73	0.63	35109		
	V 3	5965	0.63	37579		
	V 4	60.48	0,63	38102		
01/07-15/07	V 1	42.17	0.47	19819	V1=161.00	V1=81429
	V 2	37.15	0.47	17460		
	V 3	37.34	0.47	17549	V2=180.70	V2=81946
	V 4	44.79	0.47	21051		
16/07-30/07	V 1	29.51	0.35	10.328	V3=180.20	V3=80193
	V 2	35.98	0.35	12593		
	V 3	31.27	0.35	10945	V4=206.49	V4=88564
	V 4	38.33	0.35	13415		
01/08-15/08	V 1	18.00	0.20	3600		
	V 2	29.40	0.20	5880		
	V 3	24.02	0.20	4804		
	V 4	27.84	0.20	5568		
16/08-30/08	V 1	0.0	0.12	0.0		
	V 2	10.40	0.12	1248		
	V 3	19.14	0.12	2292		
	V 4	25.90	0.12	3108		

From the data presented in Table 5 it is shown that the highest incomes are realized in the fourth variant (12- Bloomed flowers) with a total of 206.49 t / ha tomatoes respectively € 88,564 (three years average), then the variant with eight Bloomed flowers (180.70 t / ha with a total of € 81,946). First variant has less production but the monetary value has been higher since the market price per unit (kg) was higher as well. Meantime the last one is the third variant (10- Bloomed flowers) with 180.20 t / ha respectively € 80,193.

Table 3.

Productivity qu/ha to the Jaguar hybrid (ANOVA)

Variants	Years			Average
	2008	2009	2010	
6- Bloomed flowers	263.00	218.67	323.71	268.46 *
8- Bloomed flowers	279.75	247.42	376.58	301.23 Ns
10- Bloomed flowers	273.00	260.46	364.54	300.33 Ns
12- Bloomed flowers	335.87	269.71	426.85	344.15 *
Average B	*288.65 **	*249.06 **	372.92 **	Interaction A x B
Factor		A	B	A x B
LSD	1%	90.658	40.849	112.364
	5%	65.555	31.067	82.824

Based on the analysis of variance and the LSD test, there are noticed significant statistically differences between variants, in terms of productivity of the tomato hybrid Jaguar we can concluded that significant differences have been to the variant with 6 bloomed flowers versus the variant with 12 bloomed flowers, while between the variants with 8 bloomed flowers (301.23) and 10 bloomed flowers (300.33) there are not statistical differences in terms

of productivity. In terms of the productivity of tomato hybrid Jaguar, between the researching years (Factor B) are highlighted highly significant statistical differences where the highest value was found during 2010 (372.92) and the lowest one during 2009 (249.06). The differences observed in terms of productivity between 2010 with 2008 and 2009 are highly significant while between 2008 and 2009 there are significant differences in terms of productivity.

The dynamic of production for six harvest periods qu/ha

From figure 1 in terms of productivity according to the harvest periods and used variants of hybrid Jaguar are noticed differences, so the lowest value has been to the third variant (87.83 qu / period) while the highest one to the fourth variant (604.75) . To the other possible combinations we have also differences as regards this parameter (Figure 1).

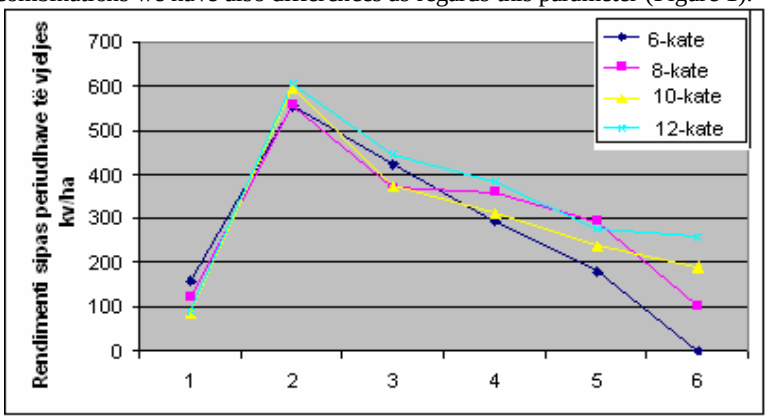

Figure 1. The dynamic of production for six harvest periods qu/ha

General productivity for six harvest periods qu/ ha

From figure 2 we can notice that that highest productivity is realized to the fourth variant (12 bloomed flowers) and that 2065.00 qu / ha, while the lowest one to the first variant (with 6 bloomed flowers) and that 1610.00 quintals / ha). As regards the other variants the realized productivity was somewhere in between.

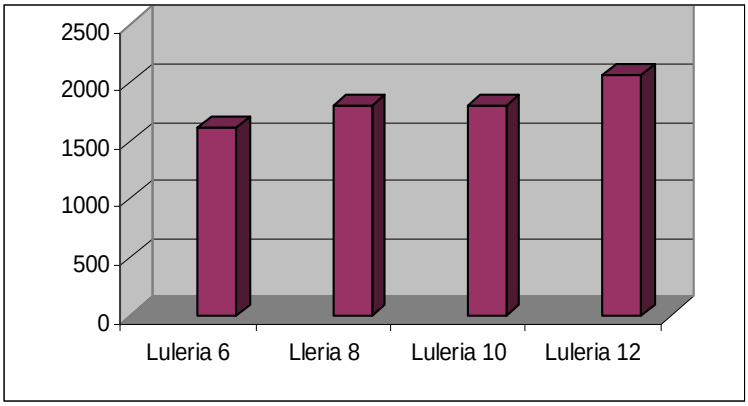

Figure 2. General productivity for six harvest periods qu / ha

CONCLUSIONS

This research undertaken at a time when production in greenhouses is attracting more and more attention of specialists, manufacturing entities, the state and several foreign entities, is aiming to introduce and realize a research of the impact of bloomed flowers in tomato productivity in solar greenhouses. Based on the study results for the period of three years we can make the following conclusions:

To the hybrid Jaguar, with 6 and 8 bloomed flowers results with early maturity and the best price in the market, but the production average is lower in comparison with other bloomed flowers.

To the hybrid Jaguar, the highest productivity is to the fourth variant (12 bloomed flowers), but it results with a lower price in the market and the lowest percentage of fruit formed.

Regarding the Economic Assessment of the hybrid Jaguar, the highest incomes are realized in the fourth variant, followed by three other variants, which expressed in monetary value has been 88 564 respectively 80 193 Euro.

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