Analysis Concerning Productivity of Some Eggplant Cultivars Tested in Comparative Plots for Evaluation

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ABSTRACT

Considering the actual global warming in Romania summers have become increasingly hot and dry, with times when temperatures are very high, thus causing serious damages to the vegetable crops, both in terms of quantity and especially in terms of the quality traits of the harvest. In this context, the selection of genotypes which are tolerant to the thermal and hydric stress represents a major objective of the eggplant breeding activity, aiming at diversifying the current variety of eggplant types, cultivated in Romania.

Keywords: *comparative plots, eggplants, varieties, lines.*

INTRODUCTION

In order to meet the consumption requirements, according to the crops destination and way of preparing the fruits, the eggplant breeding process aims at obtaining some cultivars properly adapted to the climate and soil conditions from different culture areas (Tudor *et al.*, 2004). The creation of the F1 hybrids represents a permanent concern of breeders for this species (Dikij *et al.*, 1983; Swarup, 1995). The climate changes over the last years have determined the orientation of the research programmes towards the selection of genotypes which are resistant / tolerant to the thermal and hydric stress, while preserving the quality traits and production potential. In this context, the selection of genotypes which are tolerant to the thermal and hydric stress represents a major objective of the eggplant breeding activity (Saleh and Saud, 1995).

AIMS AND OBJECTIVES

The study of eggplant genotypes, in the comparative plots for their behavior, aiming at selecting those with high production potential and with good quality fruits, well-adapted to the climate changes over the last period (thermal and hydric stress).

MATERIALS AND METHODS

During the years 2012-2013, a number of nine cultivars (two hybrid combinations-HL332 and HL228, four advanced homozygous lines achieved at RIVFG Vidra-L31,L3-1,L12-3 and three local populations-LP IL, LP TM, LP VN) have been studied in the comparative plots for their behavior. The yield capacity and fruits' quality have been watched, using as a control variety the cultivar Luiza. The arrangement of variants in the experimental field was made according to the experimental technique (25 square meters for each variant) following the randomized blocks method, in four repetitions. The yield capacity of the analyzed genotypes was determined by summing up the fruit quantities obtained, in dynamics, for each experimental variant/repetition. Upon the fruits' harvesting, the crop's quality traits were evaluated. At the same time, the fruits' average weight, color, length and diameter, as well as the frequency of the attack from the pathogenic agents on the plants and fruits, have been observed. The production data were statistically processed by the analysis of variance, while the level of significance of the production differences was established by means of the difference limit (Ciulca S, 2002). For a better evaluation of the different physiological

Tab.1. Yield analysis for eggplant genotypes.

Cultivar	Average yield t/ha	Relative yield %	Difference $\pm$ as compared to the control variety	Significance
HL 332	53.54	110.57	+ 5.12	***
HL 228	52.95	109.35	+ 4.53	**
L22-8	48.50	100.16	+ 0.08	-
Luiza (control)	48.42	100.00	-	-
L-31	48.01	99.15	-0.41	-
L-3-1	46.38	90.45	- 2.04	-
L12-3	43.80	87.52	- 4.62	000
LP -IL	39.12	80.79	- 9.30	000
LP-TM	34.20	70.63	-14.22	000
LP-VN	32.50	67.12	-15.92	000
LSD 5%=3.1 LSD 1%=4.42 LSD 0.1=6.01				

periods of the genotypes under analysis, the sum of the active temperature degrees necessary for the crops' formation, was determined (in the climate conditions of 2012 - very high temperatures and severe drought, both pedological and atmospheric, during the period of June-September). During the entire vegetation period, the specific technology for eggplant cultivation has been followed, while ensuring the optimal conditions for the plants' development.

RESULTS AND DISCUSSIONS

The analysis of the fruit production of the cultivars under study shows that the production was between 53.54 t/ha (LH-332) and 32.5 t/ha (PL-VN), while only two genotypes of the nine very significantly and distinctly significant exceeded the control variety Luiza. All three studied local populations achieved very significantly negative productions as compared to the control type (table 1).

The HL 332 has vigorous tall plants, with light-green colored leafage. The fruits are big (370 g) – ovoid-elongated, dark-violet colored, with shiny peel. The fruits' length is 24-26 cm and the fruits' diameter is 7-8 cm. The L22-8 genotype presents tall plants with light-green leafage. It has piriform elongated-cylindrical fruits, dark-violet (black) colored, with shiny peel. The fruits' length is 24-26 cm and the fruits' diameter is 5-6 cm. For the sum of the active temperature degrees, calculated for the main phenophases of the genotypes under analysis, there are significant differences recorded. Among the analyzed genotypes, the LH332 and the L31 lines required a smaller sum of the active temperature degrees, from emergence to flowering (662.79°C and 324.48°C respectively), as well as from flowering to the fruits' technical

maturation (670.46°C and 388.20°C respectively), as compared to the other genotypes. The results shown in the table number 1 represent average values of the two years of experiments. From the results of Saleh and Saud (1995) appears that an improvement in eggplant cultivars could be made through breeding program.

CONCLUSION

The study of the nine eggplant genotypes in the comparative plots for their behavior showed that only two genotypes (LH332 and L-31) achieved higher quality yields as compared to the control variety Luiza. These were distinguished by the fruits' shape, color and size. The sum of the active temperature degrees, smaller for these two genotypes, determined the extension of the fruiting period and therefore a higher fruit production. The low yield of the local populations, obtained over the two years, revealed their inadequate capacity to adapt.

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