



*Original Contribution*

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**COMPARATIVE TESTING OF VARIETIES EGGPLANT,  
KEPT FOR INTERMEDIATE AGRARIAN PRODUCTION**

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**ABSTRACT**

The eggplant is a traditional vegetable crop, utilized both for consumption and as raw material for the canning industry. Due to lower sale prices during the summer months, using high yield varieties is a good way to increase economic efficiency of such production.

Local producers are facing difficulties in choosing the right variety, because of the existing diversity, the lack of detailed specifications and frequent changes of varieties, and also because of the fact that the increase of yields is achieved in different ecological and geographical conditions and different technologies.

The purpose of this work is to investigate the economic efficiency of some new varieties, grown in the most suitable period of agrarian production in Bulgaria.

Our research so far, gives us ground to recommend, the two most promising varieties Petra and Valentina, as better adapted for growing under the technology of intermediate agrarian production.

**Key words:** agricultural qualities, economic efficiency.

**INTRODUCTION**

Eggplant is a traditional culture for polish production in Bulgaria. A significant portion of the production satisfies the needs of the canning industry. The great diversity of varieties offered on the Bulgarian market makes the choice difficult for the specific climatic conditions (1). The dynamics in the varietal list in this culture and breeders striving to respond to the growing demands of the market, made the recent issue of systematic testing of new varieties. Selection of new high yield varieties eggplant for intermediate agrarian production is the purpose of our study.

**MATERIAL AND METHODS**

The survey was conducted during 2007-2008 in the Department of Horticulture at

the Agricultural University – Plovdiv. Experience was held on alluvial - meadow soil. Seedlings were grown in plastic greenhouses at sowing in the third week of March. Plants were planted on May 15 in scheme 100 +60 x 35 cm and grown under standard technology for intermediate agrarian production (2, 3). Seven eggplant varieties were studied - Solanum melongena, originating from Holand: Bibo (BS 255), Mirabelle F<sub>1</sub>, Valentina, Petra F<sub>1</sub>, Cloud Nime F<sub>1</sub> and Hedida F<sub>1</sub>. The polish experience is displayed in the block method in four iterations (4). For control was used Eggplant 12 variety, included in the official catalog of Bulgaria, as traditional for the country. Economic performance: average fruit weight - g; composition of dry matter -%. total amount sugar -%, raw protein %, solanin - mg/100g of dry matter. It was determinate in fenofaz mass fructification. Assessment of economic efficiency by raising the test varieties is determined by a system of indicators: Average standard yield, (kg/da); Total production Levs (BGN) / da,

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Production cost Levs / da, Seeds expenses Levs, Net Production Levs / da, Net Income Levs / da, Profitability (%), Prime cost Levs / per. 100 kg, Sale price Levs / kg. (5, 6, 7). The choice of these indicators can be explained by the fact that all the tested varieties are grown on the same technology adopted in the country for the production of eggplant.

## RESULTS AND DISCUSSION

Results from the study show that all tested varieties have different biochemical composition and fruit weight (**Table 1**). Biochemical parameters (average fruit weight - g; composition of dry matter -%, total amount sugar -%, raw protein -%, solanin - mg/100g of dry matter) in turn determine the quality of eggplant as raw material for processing industry and its biological value. The fruit weight is not proportional to the yield obtained. In stage of mass fructification the greatest weight have the fruits of plant varieties Petra 486,9 g and Valentina 481.9 g. They exceed the control by 6.82% and 5.73%. On this item the other options are lower than the control. The smallest mass of fruit have Cloud Nine and Bibo, respectively 297.59 and 394,8 g. Lower to the control, by respectively 158.3 and 61 g. In dry

matter content the test varieties exceeded the control, which makes them better as raw material for the canning industry. Exceptions make the varieties Valentina and Mirabelle, where values of this index were - 11.60 and 11.65% are lower than controlled variety Eggplant 12, where dry matter is 11.95%. It is striking that the differences between the versions are small. In the content of total sugars are not observed significant differences between the versions. The control is with the lowest cost. These results indicate that on this quality indicator, the studied of varieties have better taste than the control variety Eggplant 12. The quality of production of eggplant is influenced by the amount of raw protein in the fruit. Established tendency of the dry matter content and the total amount of sugar are maintained in this index. It is striking that the differences between the versions are slight. Higher is the content of raw protein in fruit varieties Petra and Valentina, compared to control, respectively 27.35 and 25.63%. Raw material quality of eggplant is determined by the content of solanin M, and quality varieties contain less quantity of it. The data obtained shows that the amount of solanin varies, depending on the variety.

*Table 1. Quality characteristics of eggplant varieties (Average for the period 2007-2008)*

Varieties	Average standard yield, (kg/da)	Average fruit weight (g)	Composition of dry matter, (%)	Total amount sugar (%)	Raw protein (%)	Solanin (mg./100g of dry matter)
<b>1.Eggplant 12</b>	4898,10	455,8	11,95	18,92	28,74	4,08
<b>2.Bibo (BS 255) F<sub>1</sub></b>	5536,30	394,8	12,49	23,42	33,17	2,75
<b>3.Mirabelle F<sub>1</sub></b>	5680,20	452,5	11,60	23,76	35,06	3,26
<b>4. Valentina</b>	5712,00	481,9	11,65	25,02	36,11	3,18
<b>5. Petra F<sub>1</sub></b>	5731,90	486,9	12,82	27,00	36,60	3,07
<b>6.Barcelona F<sub>1</sub></b>	5357,70	407,1	12,07	22,41	31,90	3,55
<b>7. Cloud Nine F<sub>1</sub></b>	5150,30	297,5	12,74	19,61	29,10	2,94
<b>8.Hedida F<sub>1</sub></b>	5313,60	442,7	11,97	22,17	31,87	3,34

In the growing process, Bibo varieties accumulate least amount of solanin (2,75 mg / 100 g of dry weight). The amount increases to 2,94 mg/100 g dry matter for the variety Cloud Nine. With little

difference is the variety Petra -3,07 mg/100 g dry matter. The test varieties with higher values are Mirabelle, Hedida and Barcelona - respectively 3.26, 3.34 and 3,55 mg/100 g dry matter. Differences

between the versions are slight. An exception makes the control variety, where the average content of solanin is 4,08 mg/100 g dry matter. Depending on the varieties used, the yields of eggplant varied during the studied period, to some degrees (**Table 1**). The results show that the highest yield of eggplant is available from Petra. Yield ranged from 5150,34 kg / da in Cloud Nine to 5731,92 kg / da for Petra. Increase on the control by respectively 105.15% and 117.02%. Yield in kg/da shows that surveyed eggplant varieties can be grown with good economic results when using our technology. The results obtained show that plants of different varieties overcome temporary stress caused by adverse weather conditions in the summer. This is due to their different genetic leanings and biological plasticity. Plant resistance to summer heat, accompanied by low atmospheric humidity positively

influence on yield. All variants exceed the control. The excess is 252,19 kg / da on Cloud Nine to 833,77 kg / da variety on Petra. Underlying business performance through an attempt to make the final economic indicators with the production quality of each eggplant variety tested. Different rates of conversion depend on the quality characteristics of varieties of eggplant. They determine the real market assessment on the consumer. The results from the experience obtained an opportunity for comparative economic assessment of eggplant varieties. It is based on the data in **Table 2**.

The total production is highest in the variety Petra and Valentina. They exceed the standard Eggplant 12 by 502.33 and 440.24 levs (BGN) per decar. These good results are due to had yields and sale prices.

**Table 2. Economic efficiency of growing new varieties of eggplant (Average for the period 2007-2008)**

Varieties	Per da					Profitability (%)	Prime cost Levs / per. 100 kg.	Sale price Levs / kg.
	Total production Levs / da.	Production cost Levs / da	Seeds expenses Levs	Net Production	Net Income Levs / da			
1.Eggplant 12	930,65	302,62	0,48	840,01	628,03	207,53	6,18	0,19
2.Bibo (BS 255) F <sub>1</sub>	1162,64	389,76	60	1012,48	772,88	198,29	7,04	7,04
3.Mirabelle F <sub>1</sub>	1249,66	395,99	60	1099,50	853,67	215,58	6,97	0,22
4. Valentina	1370,37	397,37	60	1220,73	973,52	244,99	6,96	0,24
5. Petra F <sub>1</sub>	1432,98	398,23	60	1282,82	1034,75	259,84	6,95	0,25
6.Barcelona F <sub>1</sub>	1232,29	382,03	60	1082,13	850,25	222,56	7,13	0,23
7. Cloud Nine F <sub>1</sub>	1030,07	373,06	60	879,91	657,01	176,12	7,24	0,20
8.Hedida F <sub>1</sub>	1275,27	380,12	60	1125,11	895,15	235,49	7,15	0,24

For the two varieties of eggplant the yields and the prices are with highest values. Production costs necessary for cultivation of 1 da. of eggplant are 302.62 levs to 398.23 levs. Production cost differs between varieties due to average yields. There is a strong upward trend in production costs for varieties with higher

average yields relative to the control Petra F<sub>1</sub>, Valentina, Mirabelle F<sub>1</sub> etc. However, the resulting disposable income per hectare is in the range of 657.01 levs / da in variety Cloud Nine F<sub>1</sub> to 1034.75 levs / da. The greatest excess of net income, compared to the control varieties have Petra F<sub>1</sub>, Valentina and

Mirabclle F<sub>1</sub>. In these species is reported lower cost. Rate of profitability in eggplant varieties was studied in the range from 176.12% to 259.84%. Lower value compared with the control in the variety Cloud Nine F<sub>1</sub> and Bibo (BS 255) F<sub>1</sub>. Highest rate of profitability in the variety Petra F<sub>1</sub> - 259,84%, variety Valentina - 244,99% followed by Barcelona F<sub>1</sub> - 222,56% and Mirabclle F<sub>1</sub> - 215,58%. The analysis of the data on the quality and economic efficiency in the cultivation of new varieties of eggplant showed the crucial role of the level of average yields obtained during the survey period. The higher average yield corresponds to higher levels of economic and quality indicators. In this respect, the variety Petra F<sub>1</sub> is unmatched and much greater than control and other varieties.

### CONCLUSIONS

1. Significant biological indicator for the realization of high yield showed studied varieties Petra, Valentina, Mirabclle and Bibo.
2. Best economic indicators are derived from varieties Petra and Valentina.
3. The examination allows us to recommend for the practice as best promising and adapted varieties Petra and Valentina, kept by intermediate agrarian production technology.

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