

THE COMPARATIVE STUDY OF EGGPLANTS VARIETIES GROWN IN GREENHOUSES IN ECOLOGICAL SYSTEM

Ienciu Andrada*, Cărbunar Mihai*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048
Oradea; Romania, e-mail:carbunar@yahoo.com

Abstract

Eggplants are vegetables from the Solanaceae family, with fruits rich in vitamins, mineral salts and active principles beneficial to the human body, being able to prevent certain diseases.

Eggplants are very demanding in terms of environmental conditions.

The ecological technology of the culture implies an increased attention related to the vegetation factors management.

The study concerning the cultivation of eggplants in greenhouses in an ecological system has been performed in a vegetable micro farm, ecologically certified, in 10 variants with 3 repetitions, whose seed has been certified organic except the Zaraza variety (untreated seed), a Romanian variety which is also the witness of the experience.

Vegetables produced by ecological technology are healthier and more beneficial to the body.

They are highly appreciated for the food that is prepared from them, generally the eggplant peel is not consumed although it is edible and very rich in antioxidants.

Key words: eggplant, ecological technology, early production, high quality

INTRODUCTION

Eggplant, *Solanum melongena* L. var. *esculentum* Dun., originating in tropical and subtropical areas of Asia, legumes cultivation that began in the late fifteenth century.

Modern medicine and specialists in nutrition given a physiological role and biologically important vegetable feed people, because they have a high nutritional value, they are absolutely necessary to ensure the vitamins, minerals, amino acids, enzymes and other nutrients they need all age groups, sex and profession. (Movileanu, 2010).

World production of vegetables increased lately, making continuous growth. Eggplant by area consumed in different quantities. Thus the average consumption is 1.5 kg / yr / capita in Southeast Asia, 5 kg in Japan, the Middle East 9-10 and 3 kg in the countries of western Mediterranean Sea (Apahidean, 2016).

Old varieties no longer grows so often due to low productivity and low resistance to pests and diseases, which led to the creation of new hybrids productivity and high resistance.

Eggplant fruits contain 92.7% water, 1.1% protein, 4.5% nitrogen free extract substances, mineral salts and small amounts of vitamins.

Eggplant peel is edible although the vast majority of individuals removes it. In this, is the main natural source of nasunin, this is the substance that gives dark pigment of eggplant fruit and serves to protect it from damage from sunlight or other sources of radiant energy. Nasunin is part of anthocyanins, and has a high antioxidant activity. Eggplant anthocyanin concentration ranges from 8-85 mg / 100 g depending on the kind (Saurabh, 2015).

Eggplant fruits have therapeutic properties, are diuretics, laxatives, anti-anemic, liver and pancreas incentives, effervescent, etc (Popescu, 2013).

Food and therapeutic value of vegetables will increase their cultivation conditions in organic farming. Organic vegetables do not contain residues of nitrate or pesticide, or have very low (Bruma 2004).

Eggplants are the most demanding in the Solanaceae family in terms of heat, light, humidity and the type of soil they are planted in.

A diet rich in vegetables underlies human growth and development of health and longevity, capable and creative work.

MATERIAL AND METHOD

Research on the behavior of certain eggplant varieties in ecological culture of solar, took place in 2017 in the town Husasău Tinca, NW country, a certified organic vegetable micro-farm.

Climatic conditions of the area is recorded in the suitability of the culture of the eggplant.

Experience is the single factor of 10 variants in three replications. The biological material consisted of 10 varieties of eggplant, whose seed has been certified organic except Zaraza variety (untreated seed), a Romanian variety which is also the witness of the experience.

The 10 varieties of eggplant are Zaraza (V1); Violetta di Firenze (V2); Carina (V3); Black Beauty (V4); Japanese Pickling (V5); Dourga (V6); Orange Turquie (V7); Monstrueuse New York (V8); Listada Yes Gandia (V9); Ting jiló Green (V10).

The experience was organized after the subdivided block method and statistical data processing was done by analysis of variance.

RESULTS AND DISCUSSION

To achieve the objectives, were analyzed for experimental culture early production and overall fruit quality analysis of the eggplant

With regard to the first parameter analyzed, to output data obtained from the early Eggplant 10 varieties are shown in Table 1. Even if the control is a Romanian variety, it has not excelled in the erliness.

Table 1

Early production of eggplant					
Nr. No.	Variety	Production absolute Kg / m ²	Production relative	± d Kg /m ²	Significance of
1	Zaraza	1.62	100	0.00	-
2	Violetta di Firenze	1.93	119.13	+0.31	xx
3	Carina	0.88	54.32	-0.74	000
4	Black Beauty	2.04	125.92	+0.42	xxx
5	Japanese Pickling	2.38	146.91	+0.70	xxx
6	Dourga	1.85	114.19	+0.23	x
7	Orange de Turquie	0.37	22.83	-1.25	000
8	Monstrueuse de New York	3.12	192.59	+1.50	xxx
9	Listada Da Gandia	1.73	106.79	+0.11	-
10	Jilo Tingua Verde	1.14	70.37	-0.48	000

LSD 5% = **0.19**LSD 1% = **0.27**LSD0.1% = **0.36**

The highest yield was recorded at Monstrueuse New York with an increase of 92.59% early production, the difference from the control group was statistically positive, very significant.

A second variety that was highlighted in a Japanese Pickling good earliness was compared to the control it was obtained 0.7 kg /m² more. The difference, Zaraza was statistically positive, very significant.

A good earliness also have obtained Black Beauty (2.04 kg / m²) and Violetta di Firenze (1.93 7 kg / m²), first kind of difference from the control was statistically positive, very significantly and the Violetta di Firenze positive, distinct significant.

With a weak earliness evidenced Orange Turquie, achieving early production of 22.83% of the witness, the difference was statistically it negative, very significant.

Also with early production were quite poor and Tinga jiló varieties Verde (70.37% of Witness) and Carina with (54.32% of the variety Zaraza), both difference from the control was statistically negative very significant.

Although variety Listada da Gandia has achieved a higher early production witnesses difference exceeding the threshold of 5%, not being statistically assured.

Another parameter studied was the productive potential of each variety from our own experience.

Data on total production of eggplant are shown in Table 2.

Table 2

Total production of eggplant					
Nr. No.	Variety	Production absolute Kg / m ²	Production relative%	± d kg /m ²	Significance
1	Zaraza	5.23	100	0.00	-
2	Violetta di Firenze	6.86	131.16	+1.31	xxx
3	Carina	4.69	89.67	-0.54	-
4	Black Beauty	6.92	132.31	+1.69	xxx
5	Japanese Pickling	4.58	87.57	-0.65	0
6	Dourga	5.49	104.97	+0.26	-
7	Orange de Turquie	2.15	41.10	-3.08	000
8	Monstrueuse de New York	5.97	114.15	+0.74	x
9	Listada Da Gandia	4.75	90.82	-0.48	-
10	Jilo Tingua Verde	3.48	66.53	-1.75	000

LSD 5% = **0.62**

LSD 1% = **0.84**

LSD0.1% = **1.15**

Except varieties Turquie Orange and Green Ting jiló, all varieties obtained good yields that fall in organic eggplant production in protected areas. The two varieties have been only 41.10 % of Orange witness the variety of Turquie or 66.53% of the jiló blank green tinge. Both difference from the control was statistically negative, very significant.

Japanese variety Pickling obtained a witness lower production but higher than previous varieties, the variety Zaraza this difference was statistically negative significant.

Best production potential of the varieties under study was the variety of eggplant Black Beauty, a production increase of 16.9 t / ha, more than the reference variety. This difference was statistically positive, very significant.

The production close to the Black Beauty, Violetta di Firenze recorded a production increase of 31.16% compared to the control, this difference was secured to statistic positive very significant.

Although Monstrueuse New York was far better earliness, high temperatures in solar have ranked 3rd in terms of productivity, only 0.74 kg / m² more than the control, the difference being provided statistically positive significant.

The other species were obtained from the blank production is not statistically similar.

Eggplants harvested at maturity for consumption. A harvesting before maturity consumption lowers total production and a harvest that exceeded optimal time, lowers quality.

Eggplant fruit quality analysis was done after each harvest, they were grouped into three quality levels, data are presented in Table 3.

Table 3

Quality of fruits eggplant

Crt. No.	Variety	Total production	Extra quality of total		The quality I of the total		II Quality of the total	
			Kg/m ²	%	Kg/m ²	%	Kg/m ²	%
1	Zaraza	5.23	2.61	49.90	1.72	32.88	0.90	17.22
2	Violetta di Firenze	6.86	4.59	66.90	1.45	21.13	0.82	11.95
3	Carina	4.69	1.42	30.27	1.86	39.65	1.41	30.06
4	Black Beauty	6.92	4.82	69.65	1.22	17.63	0.88	12.71
5	Japanese Pickling	4,58	3,74	81,65	0,61	13,31	0,23	5,02
6	Dourga	5,49	3,48	63,38	1,25	22,76	0,76	13,84
7	Orange de Turquie	2,15	1,02	47,44	0,46	21,39	0,67	31,16
8	Monstrueuse de New York	5,97	3,36	56,28	1,39	23,28	1,22	20,43
9	Listada Da Gandia	4,75	3,21	67,57	0,89	18,73	0,65	13,68
10	Jilo Tingua Verde	3,48	2,47	70,97	0,64	18,39	0,37	10,63

*Witess

For each of the three levels of quality it was determined as a percentage and in kg / m² of the total production .

Analyzing as an entity the quality of the 10 varieties studied as there is a remark of a higher quality except their upper Carina (30.27% of total) and zaraza (49.90% of total). The remaining varieties all registered quality products extra 50% reaching to 81.65% of the total production Pickling Japanese variety.

Fruit quality I have ranged between 13.31% and 39.65% in Japanese Pickling Carina.

Second quality of the total was 5.02% in Japanese Pickling and 30.06% Carina.

CONCLUSIONS

Research on studying the behavior of several varieties of eggplant grown in culture ecological solar Husasău Tinca has permitted some conclusions:

1. The only Romanian variety chosen as a witness behaved quite well both in terms of earliness production potential and a little low for quality (fruits quickly fade).
2. New York Monstrueuse variety in earliness was observed with a 3.12 kg / m² this being due to the first fruit harvested large. Production potential was exceeded later Black Beauty.
3. Carina variety with a lower yield potential witness, but close to it, with a fairly low earliness and fruit quality far worse, did not live up to expectations.
4. Black Beauty variety with the highest production potential, earliness with good fruit quality may be recommended to growers in the area.
5. With an odd shape, look and attractive colors and high quality fruit varieties Japanese Pickling is further promoted even diversifying assortment.
6. The Dourga variety, the only variety with white skin showed an average earliness, higher production potential witness and high quality fruit.

REFERENCES

1. Apahidean Al.S., Al.I. Apahidean, 2016, Legumicultura, Ed. Risoprint, Cluj-Napoca.
2. Banu C., 2010, Alimente funcționale, suplimente alimentare și plante medicinale, Editura Asab, ISBN: 978-973-7725-83-7
3. Beceanu, D., 2008, Nutritive, Nutraceutical, Medicinal and Energetic Value of Fruits and Vegetables -University of Agricultural Sciences and Veterinary Medicine of Iași Vol. XLI , Nr.4
4. Brumă S., 2004, Tehnologiile ecologice pentru producția vegetală și creșterea animalelor, Editura Fundației Academice pentru Progres Rural „Terra Nostra” Iași, România
5. Ciofu Ruxandra, N. Stan, V. Popescu, Pelaghia Chilom, S. Apahidean, A. Horogoș, V. Berar, K.F. Lauen, N. Atanasiu, 2004, Tratat de legumicultură. Ed. Ceres, București
6. Movableanu V., 2010, Importanța alimentară și economică a culturii legumelor, UASM - “Economie și sociologie” Nr. 2, Chișinău, ISSN 1857- 4130
7. Popescu, V., Roxana, Zăvoianu, 2013, Cultura tomatelor, ardeiului și vinetelor, Editura M.A.S.T., București
8. Saurabh S., Bilashini, Devi Mayanglambam, 2015, Vegetables as a potential source of nutraceuticals and phytochemicals, in International Journal of Medicine and Pharmaceutical Sciences (IJMPS), Vol. 5, Issue 2