

## RESEARCH ON THE GROWTH AND DEVELOPMENT OF SEVERAL EGGPLANT VARIETIES IN ORGANIC FARMING

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### **Abstract**

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

*The study on the cultivation of eggplants in organic and conventional systems was carried out in two vegetable farms, where two monofactorial experiences with eggplants were mounted, each with seven variants in three rehearsals. Each variant had a number of ten plants. In both experiments the planting distances were 70 cm between the rows and 40 cm between the plants per row and 30 cm respectively.*

*As regards the importance of vegetables in human food, their consumption is an indicator of living standards.*

*Eggplants contribute to the diversification of the range of vegetables, they can be grown in all crop systems, making fruit good on the domestic and foreign markets.*

**Key words:**eggplant, ecological system,conventional crops,plant density

### INTRODUCTION

The vegetable culture is considered a very old concern for the discovery and use of new food sources, given the richness of existing species and varieties. It has developed in the modern era, along with the process of technology.

According to dieticians' recommendations, for a rational diet, the daily intake requirement of an adult is 714 g of animal food and 1225 g of food of vegetable origin of which approximately 300-400 g of vegetables (representing an annual consumption of 110-148 kg Ciofu et al., 2004).

Growing eggplants as vegetable plants began towards the end of the fifteenth century.

In the chemical composition of vegetables predominates basic elements (Ca, K, Na, Mg, Fe) and not acid (Cl, P, S) so that most vegetables have a neutralizing effect on the acidity created by eating high protein (meat, bread, eggs) (Apahidean, 2016).

The high content of solanine and other bitter substances does not allow raw consumption, so they are only used in the prepared state (Indrea, 2009). Mixed with other vegetables, they are used in the preparation of canned food (Ciofu, 2004).

Fruits contain 7-10% dry substance, 3.5% carbohydrate, 1% to 1.6%, carbohydrates 4.8 g, 0.2% fat, 2.58 g fiber, 100 g fresh product, 93.3% being water (Apahidean, 2016). Eggplants have a relatively low energy value of 24-28 kcal / 100g.

Mineral herbal substances are: potassium 238 mg%, calcium 14 mg%, magnesium 9 mg%, sodium 6 mg%, sulfur 15 mg%, phosphor 34 mg%, chlorine 34 mg%, aluminum 815 µg%, boron 100 µg% 600 µg%, iodine 2 µg%, manganese 210 µg%, copper 135 µg% (Banu, 2010).

## MATERIAL AND METHOD

Research on arable crops was carried out in 2018 in two vegetable microferms adjacent to Husasau de Tinca (NW Romania).

The biological material was represented by 7 cultivars of eggplants: Zaraza, Violetta di Firenze, Black Beauty, Japanese Pickling, Dourga, Monstrueuse of New York and Listada da Gandia. Zaraza variety was the mother of experience, being the only variety of Romanian origin.

Description of the varieties:

**Zaraza** is a Romanian, first class, tolerant to disease, destined for fresh and industrialized consumption. The fruits are cylindrical, slightly piliform, with an average length of 19-20 cm, large diameter, 7.5-8.0 cm, average fruit weight 450g.

**Violetta Di Firenze** is a fairly large variety of oval-shaped fruits with the purple color striped with white. Usually it produces about 8 fruits per plant.

**Black Beauty** is an early, very old and popular variety that produces 4-6 large fruit, with a weight of between 0.4 and 1.2 kg and about 13 cm in length with a deep black color.

**Japanese Pickling** is an early Japanese origin, producing glossy, thin, curved purple fruit with a length of 25-40 cm and a diameter of 2.5 - 5 cm. The pulp is soft, white and has a sweet taste.

**Dourga** is an early variety, adapted to a cooler climate, suitable for all types of crops and is very resistant to diseases. The fruit is elongated, white in size about 20 cm in length and weighing between 400 and 600 g.

**Monstrueuse of New York** is a very old, late and vigorous variety of very large size. The fruits are rounded, dark purple, glossy and can reach up to 4 kg. The pulp is dense and contains few seeds.

**Listada da Gandia** is a recommended variety for warm regions because it resists warmth and drought. Fruits are oval, 12-15 cm long. The epidermis is creamy with violet pink stripes. The pulp is dense, tender and of good quality. The calyx is green and has thorns.

In order to achieve the proposed objectives, two monofactorial experiences with eggplants were mounted, each with seven variants in three

rehearsals. Each variant had a number of ten plants. An experience has developed in organic culture and the other in conventional culture. In both experiments the planting distances were 70 cm between the rows and 40 cm between the plants per row and 30 cm respectively.

The surface of an experimental variant had 2.8 square meters respectively 2.1 square meters in the case of the distance between plants of 30 cm.

The arrangement of the experimental variants was done by the subdivision of the blocks, the statistical processing of the data was made by the analysis of the variant.

In all experimental variants, plant height was studied, a factor that may influence the production of fruit at the surface unit.

In order to carry out the studies, observations and measurements were made which were subsequently processed statistically.

## RESULTS AND DISCUSSIONS

After the periodic checks and the processing of the experimental data, tables were prepared for statistical processing in the first experience regarding the height of the eggplant plants, the data from the conventional crops were analyzed and processed with planting distances of 70 cm between rows and 40 cm between plants in a row.

Table 1

Influence of harvest on plant height (cm)  
(conventional planting distance 70/40)

Crt. No.	Variant	Absolute height cm	Height relative	± d cm	Significance
1.	Zaraza(Mt)	69.00	100	0.00	-
2.	Viioleta di Firenze	67.00	97.10	-2.00	-
3.	Black Beauty	45.00	65.21	-24.00	000
4.	Japanese Pickling	58.00	84.05	-11.00	00
5.	Dourga	64.00	92.75	-5.00	-
6.	Monstrueuse de New York	49.00	71.01	-20.00	000
7.	Listada da Gandia	66.00	95.65	-3.00	-

LSD5% = 8.28

LSD1% = 10.01

LSD0.1% = 14.15

Table 1 shows the height of conventional crop plants (70/40).

It is noted that the control showed the best growths, the plant average of 69 cm. None of the other varieties exceeded this height.

It was noted, for example, the Black Beauty variety, whose plants reached only 65.21% of the height of the witness. The difference was statistically neglected very significantly.

Another species that showed rather weak growth was Monstrueuse of New York, where the average of the plants in the three rehearsals was 20 cm

less than the Zaraza variety. The difference was statistically significantly negative.

Plant heights very close to the height of the witness were at Violetta di Firenze 2 cm less, and 3 cm at the Listada da Gandia variety. For both varieties the differences were small that they did not exceed the P = 5% threshold and were not statistically assured.

The data on the height of eggplants with a higher density are shown in

*Table 2*

Influence of harvest on plant height (cm)  
(conventional planting distance 70/30)

Crt. No.	Variant	Absolute height cm	Height relative	± d cm	Significance
1.	Zaraza(Mt)	79.00	100	0.00	-
2.	Violetta di Firenze	69.00	87.34	-10.00	0
3.	Black Beauty	56.00	70.88	-23.00	000
4.	Japanese Pickling	82.00	103.79	+3.00	-
5.	Dourga	74.00	93.67	-5.00	-
6.	Monstrueuse de New York	60.00	75.94	-19.00	000
7.	Listada da Gandia	70.00	88.60	-9.00	-

LSD5% = 9.48

LSD1% = 11.43

LSD0.1% = 16.33

If we also refer to conventional culture but with a higher plant density (70/30 cm), the situation is almost identical, both in the witness and the other varieties were higher plant growths, and in the Black Beauty and Monstrueuse varieties of New York, the increases were almost proportional to previous experience.

At the two previously mentioned varieties, the differences were 23 cm at Black Beauty and 19 cm at Monstrueuse in New York. Both differences from the control were statistically significantly negative.

If in previous experience the height of plants in the Japanese Pickling variety was 11 cm smaller than in the case of the higher density variant, the height of the plants exceeded the height of the witness. However, the difference was rather small (+ 3cm), so it was not statistically assured. It was practically the only variety of two experiments that had growths over Zaraza plants.

If, in the previous case, Violetta di Firenze had near-witness growth, in the case of increased density, the increases were 10 cm lower than the Zaraza variety. The difference was statistically significantly negative.

If we analyze the height of the plants in ecological culture, the crop technology shows that the Zaraza variety does not react favorably to this technology. Table 3 presents the experimental results of the height of plants grown in an ecological system and with a density of 70/40 cm.

Table 3

Influence of harvest on plant height (cm)  
(conventional planting distance 70/40)

Crt. No.	Variant	Absolute height cm	Height relative	± d cm	Significance
1.	Zaraza(Mt)	48.00	-	-	-
2.	Viioleta di Firenze	56.00	116.66	+8.00	xx
3.	Black Beauty	58.00	120.83	+10.00	xxx
4.	Japanese Pickling	55.00	114.58	+7.00	xx
5.	Dourga	57.00	118.75	+9.00	xx
6.	Monstrueuse de New York	41.00	85.41	+7.00	00
7.	Listada da Gandia	57.00	118.75	+9.00	xx

LSD5% = 5.76

LSD1% = 6.46

LSD01% = 9.94

The table shows that except the Monstrueuse de New York variety, all other varieties had increases over the height of the control variety.

Plants of the Monstrueuse variety of New York reached 85.41% of the height of the witness. The difference was statistically significantly negative.

The most relevant increases compared to the control were observed in the Black Beauty variety with a median height of 58 cm, with a difference of 10 cm from the control, it recorded the highest height of the plants, the difference was statistically positive very significant.

The rest of the varieties had rises above the witness level of 7 cm in Japanese Pickling and 9 cm in the Listada da Gandia variety. All differences from the control were statistically significantly different.

The increase of plant density in ecological system has led to a change in the growth of studied varieties as shown in Table 4.

Table 4

Influence of harvest on plant height (cm)  
(conventional planting distance 70/30)

Crt. No.	Variant	Absolute height cm	Height relative	± d cm	Significance
1.	Zaraza(Mt)	56.00	100.00	0.00	-
2.	Viioleta di Firenze	63.00	112.50	+7.00	x
3.	Black Beauty	64.00	114.48	+8.00	x
4.	Japanese Pickling	60.00	107.14	+4.00	-
5.	Dourga	65.00	116.07	+9.00	xx
6.	Monstrueuse de New York	44.00	78.57	-12.00	000
7.	Listada da Gandia	68.00	121.42	+12.00	xxx

LSD5%=6.72

LSD1%=8.11

LSD0,1%=11.58

And in this case, only the Monstrueuse of New York variety did not manage to cross the Witness high. The difference of 12 cm from it was statistically negative very significantly.

It should be noted that the Monstrueuse variety of New York has very large fruits, which influences the total height of the plant. If, in the previous case, the Black Beauty variety had the best growths, in this case the Listda da Gandia variety managed to overcome the Zaraza variety by 12 cm. This difference was assured statistically positive very significantly. The Dourga variety with white fruit exceeded the Witness by 16.07%, the difference was statistically positive distinctly significant.

### CONCLUSIONS

Following the researches carried out at Husasau de Tinca in 2018 on several varieties of organic and conventional crops, some conclusions have been drawn as follows:

1. Conventional eggplant cultures determine higher plant growth compared to organic of them, as evidenced by all the varieties studied.
2. Whether we are talking about conventional or ecological culture, the density of plants in culture influences the height of the plants.
3. The only Romanian variety (Zaraza) witnessed significant increases in plant height in a conventional system, but ecological technology has no positive effects on plant height, most varieties in organic culture have exceeded the height of the witness.
4. The Black Beauty variety showed the weakest growth in conventional culture at a density of 40 cm between plants per row and at 30 cm.
5. The varieties with the largest fruits, Black Beauty and Monstrueuse of New York, had the weakest increases in the conventional system, but Black Beauty had the best organic growths of 40 cm between plants in a row.
6. The Monstrueuse variety of New York recorded the weakest increases in both conventional and organic systems at both planting densities.

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