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RESEARCH ON THE INFLUENCE OF CULTIVAR ON FRUIT PRODUCTION AND QUUALITY IN THE CULTIVATION OF EDIBLE PUMPKIN

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Abstract

The edible pumpkin has been known since antiquity, but it was introduced to Europe only at the end of the ninth century. Used as a vegetable, it helps to improve diversity, especially in the cold season. Pumpkin can be added to herbs due to its many health benefits. Pumpkin seeds are becoming increasingly important. The research took place in two different places located in NW of Romania. The objective of the research was the production obtained from several pumpkin crops, grown in a conventional and ecological system. There were cultivars with both big and small productions.

Key words: pumpkin, cultivar, production

INTRODUCTION

As a versatile vegetable, Cucurbita maxima makes a valuable contribution to food resources around the world. In addition to the development of improved fruit crops, attention must be paid to the potential of leaves and seeds.

The pie pumpkin is native to Latin America, has a long history and was cultivated by ancient civilizations in Central and South America about 7,000 years ago (Zvalo and Respondek 2007). There is also compelling evidence from archeological sites in Central America and the South that C. Maxima were widely cultivated in pre-Columbian times. Cucurbita pepo has a common ancestor with C. moschata and C. argyrosperma, but not with C. maxima (Decker-Walters et al., 1990).

We can appreciate that the center of diversity, the edible pumpkin (Cucurbita maxima), exists in temperate areas of South America, where agricultural areas have a number of interesting features. Many areas of this species are also found in North America, the Australian continent and different African countries: Nigeria, Zambia, Asia: India, Iran and China, and Europe: Turkey and Spain (Ferriol and Pico 2008).

It was introduced in Europe in the late nineteenth century. Later, the culture spread to neighboring countries in southern Europe, the Mediterranean, and then entered the Balkan countries such as Greece, Turkey and Bulgaria.

Given its proven effects on health, Cucurbita maxima Duch. (pumpkin) can be included among other medicinal plants. Among the known pharmacological activities are: antitumor (Hartwell, 1967; Saha et al., 2011), anti-obesity (Das et al., 2010), antidiabetic (Saha et al., 2011), hepatoprotective (Saha et al., 2011), diuretics (Jose et al., 2008), antioxidant (Attarde et al., 2010), antigenotoxic (Villasefior and Lemon, 1996), dewormer and taenicide (Al-Rawi and Chakravarty; Burkill et al., 1966), remedy for anthrax (Al-Rawi and Chakravarty, 1964), used in poultices (Al-Rawi and Chakravarty, 1964; Pitier, 1926), tonic (Al-Rawi and Chakravarty, 1964), wound healing (Hartwell, 1967). In addition, pumpkin seed oil has been recognized for several health benefits such as preventing enlargement and reducing prostate size, thus reducing the symptoms of benign prostatic hyperplasia (Carbin and Eliasson, 1989; Carbin et al., 1990; Koch, 1995; Schiebel -Schlosser and Friedrich, 1998), reduction of bladder and urethral pressure and improvement of bladder function; two unsaturated fatty acids oleic and linoleic acid may be relief of prostate enlargement symptoms.

MATERIAL AND METHOD

The research took place in 2020, in a locality located in the NW of Romania (Bălaia), in a vegetable garden and the second experiment took place in an ecological microfarm in another locality (Husasău de Tinca). The objective of the research was the production obtained from several pumpkin crops, grown in a conventional and ecological system. The two single-factor experiments had 10 variants, each variant having 5 nests with 2 plants per nest. The placement was done by the method of subdivided blocks, the data processing was done by analyzing the variance. The biological material was represented by 10 varieties, namely: Tudor, Musquee de Provence, Pumpkin Bleu de Hongrie, Pumpkin Vert Olive, Hubbard Vert, Dickinnson, Red Kuri, Pleine de Naples, Bush Delicata, Musquee Butternut.

RESULTS AND DISCUSSION

For the two experiments, conventional culture technologies were applied to the one located in Bălaia, respectively ecological to the one located in Husasău de Tinca. The first aspect analyzed was the production of pumpkins for the 10 varieties in two cropping systems. Analyzing the first table as a whole, it can be seen that in some varieties very high fruit productions were obtained, while in some very small productions. Comparing the yields from the two cropping systems, it is observed that except for the Plaine de Naple variety for all the other varieties, the production in the conventional system was higher compared to the organic production. Compared to the average experience, the largest increase in production was

recorded for the Plaine de Naple variety in the ecological system of 102.49%, the difference being ensured statistically very significant positive. Highly significant statistically positive positive production increases were also obtained: Plaine de Naple in conventional system, Dikinson in conventional system as well as Musquee de Provence in both culture systems. The lowest production was recorded for the Bush Delicata variety of 1.58 kg / m2 in the conventional system and 1.32 kg / m2 in the organic system. In both variants, the difference from the average experience was ensured with a very significant negative statistic. Small amounts of fruit obtained below the average of the experience were found in both systems of the varieties: Musquee Buternut, Red Curry, Hubbard Vert and Potiron Vert Olive.

Table 1

Pumpkin production grown in the two cropping systems
(Husasău de Tinca; Bălaia)

Variant		Production of pumpkin		± d kg/m^2	The significance of the difference
Variety	System of crop	kg/m^2	%		
Tudor	Ecologic	4.05	100.99	+0.04	-
	Conventional	4.39	109.47	+0.38	-
Musquee de Provence	Ecologic	6.22	155.11	+2.21	XXX
	Conventional	7.47	186.28	+3.46	XXX
Potiron Bleu de Hongrie	Ecologic	3.81	95.01	-0.2	-
	Conventional	4.57	113.96	+0.56	X
Potiron Vert Oliv	Ecologic	2.72	67.83	-1.29	000
	Conventional	3.02	75.31	-0.99	000
Hubbard Vert	Ecologic	1.41	35.16	-2.6	000
	Conventional	1.97	49.12	-2.04	000
, Dickinnson	Ecologic	4.75	118.45	+0.74	XX
	Conventional	6.82	170.07	+2.81	XXX
Red Kuri	Ecologic	2.90	72.31	-1.11	000
	Conventional	3.00	74.81	-1.01	000
Pleine de Naples	Ecologic	8.12	202.49	+4.11	XXX
	Conventional	7.99	199.25	+3.98	XXX
Bush Delicata	Ecologic	1.32	32.01	-2.69	000
	Conventional	1.58	39.40	-2.43	000
Musquee Butternut	Ecologic	1.86	46.38	-2.15	000
	Conventional	2.29	72.81	-1.72	000
Average		4,01	100	0.00	
	LSD (P 5%)		0.48		
	LSD (P1%)		0.62		
	LSD (P 0,1%)		0.82		

Next, the quality of the pumpkin fruits was analyzed. As qualitative parameters, the obtained fruits were compared with the standards described for each variety. Table 2 presents the productions on 2 qualities for the analyzed varieties both in absolute production and as a percentage of the total production. In most varieties, the first quality fruits were superior to the second quality ones. There were a few exceptions, namely: at Musquee Buternut the ecological version, Bush Delicata both variants, Plaine de Naple both variants, Red Currry and Dikinson. The variant that made the most quality I fruit was Potiron Vert Olive of 71.32% of the total. Although, in absolute production it represented 1.94 kg / m2. Even if the Plaine de Naple variety obtained the highest quality I production of 3.69 kg / m2 in percent of the total, it represented only 45.44%. The first quality fruits for the 10 pumpkin varieties registered between 38.17% and 71.32% for the Potiron Vert Olive variety in ecological system.

Table 2

The quality of pumpkin fruits (Husasău de Tinca; Bălaia)

Variant			1st quality		2st quality	
Variety	System of crop	**kg/m²**	**kg/m²**	**%**	**kg/m²**	**%**
Tudor	Ecologic	4,05	2,48	61,23	1,57	48,77
	Conventional	4,39	2,31	52,61	2,08	47,39
Musquee de Provence	Ecologic	6,22	3,75	60,28	2,47	39,72
	Conventional	7,47	3,97	53,14	3,50	46,86
Potiron Bleu de Hongrie	Ecologic	3,81	1,82	47,76	1,99	52,24
	Conventional	4,57	2,15	53,61	2,42	46,39
Potiron Vert Oliv	Ecologic	2,72	1,94	71,32	0,78	28,68
	Conventional	3,02	2,15	71,19	0,87	28,81
Hubbard Vert	Ecologic	1,41	0,88	62,41	0,53	37,59
	Conventional	1,97	1,15	58,61	0,82	41,39
, Dickinnson	Ecologic	4,75	2,31	48,63	2,44	51,37
	Conventional	6,82	3,21	47,06	3,61	52,94
Red Kuri	Ecologic	2,90	1,28	44,13	1,62	55,87
	Conventional	3,00	1,41	47,00	1,59	53,00
Pleine de Naples	Ecologic	8,12	3,69	45,44	4,43	54,56
	Conventional	7,99	3,41	42,67	4,58	57,33
Bush Delicata	Ecologic	1,32	0,48	36,38	0,84	63,64
	Conventional	1,58	0,67	42,40	0,91	57,60
Musquee Butternut	Ecologic	1,86	0,71	38,17	1,15	61,83
	Conventional	2,29	1,18	51,52	1.11	48,48

CONCLUSIONS

Research on the production and quality of pumpkin fruit obtained in two different locations and two different systems has revealed a number of conclusions, namely:

1. The quantity of fruit obtained for the 10 varieties in 20 variants showed varieties with very high production potential, respectively varieties with very low yields per unit area.
2. With one exception, all conventional variants were productively superior to ecological variants.
3. The highest production per unit area was obtained for the ecological variant of the Plaine de Naple variety of 81.2 t / ha, a very high production.
4. The production of 13.2 t / ha obtained for the Bush Delicata variety was the lowest production, and in order to become economically efficient, the fruits must be capitalized at a fairly high price.
5. The variant with the highest percentage of quality I fruit was the organic one of the Potiron Vert Olive variety (71.32%), followed closely by the conventional variant of the same variety (71.19%).
6. The lowest quality fruits were found in the organic version of the Bush Delicata variety and the organic version of the Musquee Buternut variety.

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