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RESEARCH REGARDING THE CULTIVATION OF BENINCASA HISPIDA IN ROMANIA

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Abstract

Benincasa hispida (winter melon, wax gourd or ash gourd) is a common vegetable widely grown in East and South Asia, with a very large fruit which by maturity loses its hairs and develops a waxy coating. The fruit is used in traditional medicine due to its proprieties: anti-inflammatory, demulcent, diuretic, expectorant, febrifuge, laxative and tonic, etc. The present paper presents the results of a field research regarding the cultivation of this plant in the pedoclimatic conditions of Romania. The research was carried out in an ecological experimental field from south of Romania (in the period May-October 2012) and is very important for the introduction to culture of this plant in our country. The results obtained and presented in this paper reveal the degree of adaptation to climate and soil and the physicochemical proprieties. Due to our results we consider that B. hispida is a plant that can be grown in our country with good technological and economical performances.

Key words**:** *characteristics, production, wax gourd growth experiment*

INTRODUCTION

In the last decades, Romania confronted itself with several periods of drought that affected the traditional cultures from our country. Due to the variations in climate and the scarce precipitation in different areas (Dobrogea, South of Moldova or South of Romanian Lowland), there are many arable lands that present future dangers of degradation or even desertification. To prevent this phenomenon, a viable solution is the use of plants that maintain the soil quality and that are especially resistant to drought. In this context, the purpose of our paper is to present the opportunities created by the the cultivation of the subtropical plant "ash or wax gourd" (*Benicasa Hispida*) in the pedoclimatic conditions of Romania.

Benincasa Hispida (Thunb.), Cogn. syns. B. cerifera Savi (named after the count Giuseppe Benincasa) is known under different names: Eng. - ash gourd, wax gourd, white gourd, white pumpkin, winter melon, watermelon; San. – Kusmandah; Hin. – Petha, Raksa; Chin. – tung kua; Span. – calabaza china or calabaza blanca. This plant is a common vegetable widely grown in East and South Asia, with a very large fruit which by maturity loses its hairs and develops a waxy coating. The fruit is used in traditional medicine due to its proprieties: anti-inflammatory, demulcent, diuretic, expectorant, febrifuge, laxative and tonic, etc. Also, the fruit is widely used in Japanese, Chinese, Indian and Indonesian cuisine and in the last decades is in great demand in the United States.

MATERIALS AND METHODS

The present paper presents the results of a field research experiment regarding the growth of this plant in an ecological field from south of Romania (in the period May-October 2012). The experiment consisted in the cultivation on one 100 meter row of 50 nests. In each nest, there were planted approximately 6 seeds from which the vines formed and spread on the ground and during the experiment period no fertilizers or irrigation was used. The paper includes the measurements and the analyses performed regarding the soil, plant and fruit.

RESULTS AND DISCUSSIONS

General aspects of the research

The seeds were planted on 7th May 2012, on one 100 meter row. The first plants have sprung up on 21 May (germination period 14 days). The situation at the 50 nests level in presented in (Table 1 and Photo 1.

Table 1 First springing - 21 May

Nests	Number of plants that sprung
6, 45, 48, 49, 50	0
1, 3, 4, 7, 8, 36, 39	1
2, 10, 12, 13, 14, 19, 21, 24, 25, 28, 34, 37, 38, 44	2
5, 9, 15, 16, 17, 29, 30, 31, 41, 42, 46	3
11, 18, 20, 22, 27, 40, 43, 47	4
23, 26, 32, 35	5
33	6

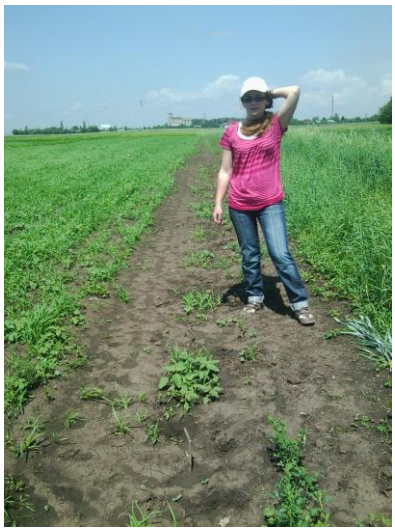

Photo 1.Carina Dobre in the field

The plant reached in one month from germination around 10 cm high and 10 days after that almost 25 cm (Photo 2).

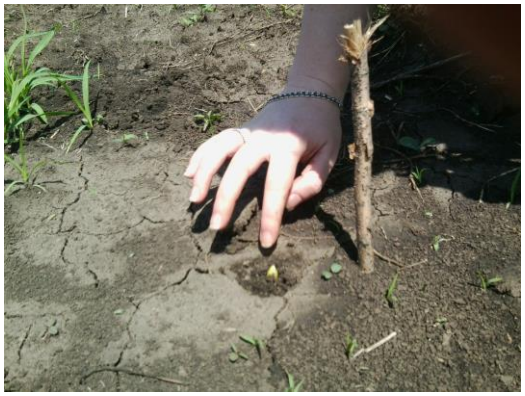

Photo 2. First springing

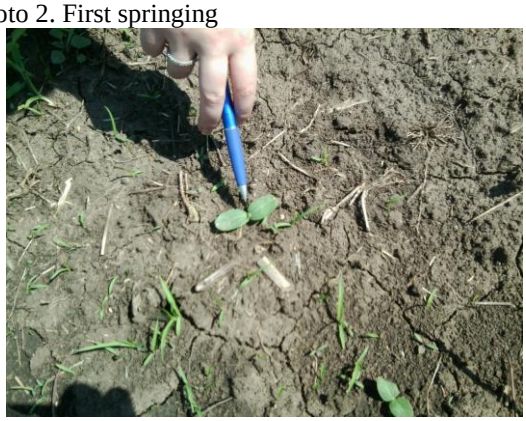

Photo 3. First springing

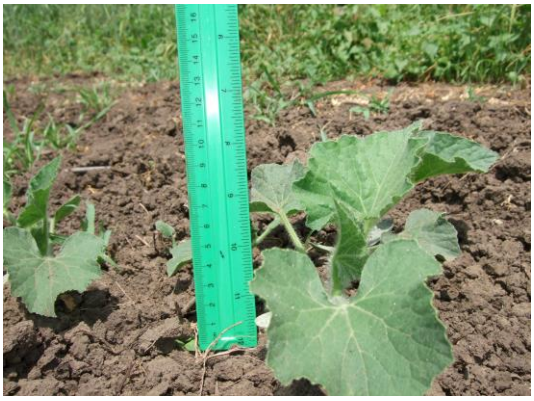

Photo 4.Rythm of growth

The flowers were observed for the first time on 17 July (at almost 60 days from germination) and were pollinated by bees. The flowers observed on 31 July were yellow, with hairy stalks, with male peduncle approximately 8 cm long and female peduncle approximately 6 cm long (Photo 5).

Photo 5.Benincasa Hispida flower – 31 July 2012

In fact, the plant is self-fertile, and the flowers are “monoecious (individual flowers are either male or female, but both sexes can be found on the same plant)” [1].

The fruits appeared one month later. They were very hairy at the beginning, in general with a globular form (Photo 6).

Photo 6. Benincasa Hispida fruit – 23.08.2012

At maturity (October – 6 months from the beginning of the experiment), the fruit developed a light tough skin and it's coated with a layer of white wax. The fruit flesh is white, thick and with a slight flavour of cucumber (Photo 7 and 8).

Photo 7.Benincasa Hispida fruit – 08.10.2012

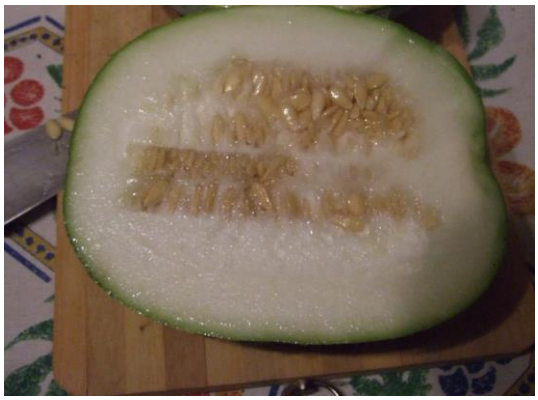

Photo 8.Benincasa Hispida fruit (Cut)– 08.10.2012

Main results of field experiment **[1]**

The vines grown spread on the ground with an evident tendency to seek shadow. All the fruits grew inside the next row cultivated with barley.

The length of the vines varied between 1.86 m and 5.50 m.

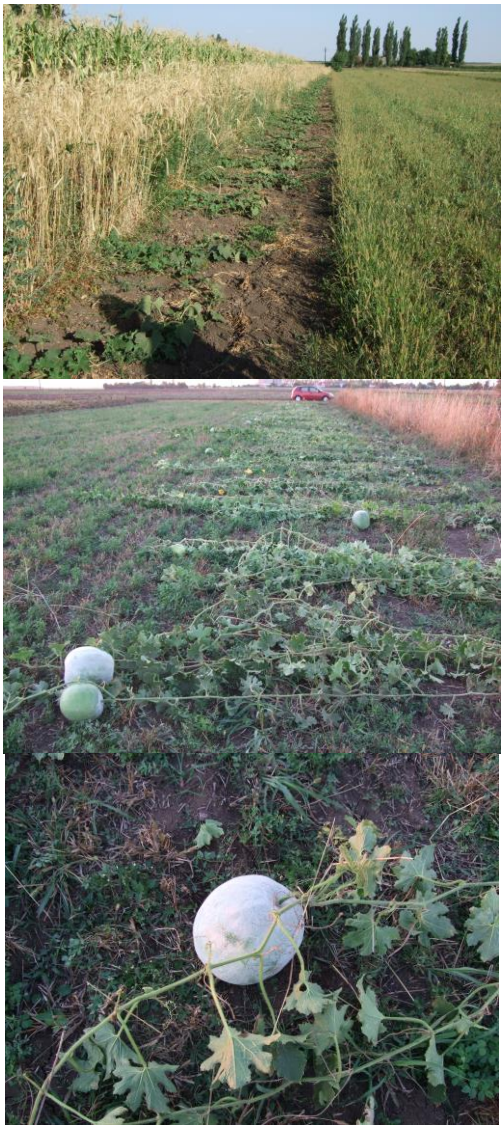

Photo 9.Benincasa Hispida fruit in the filed – 08.10.2012

We obtained a maximum 4 fruits per a vine but there were also vines with no fruit. The smallest fruit had 0.28 kg and a diameter of 24 cm. The biggest fruit had 5.18 kg and a diameter of 73 cm (Table 1).

Table 2 Research field results

Nest No	Vine No	Maximum length per vine Meters	Fruits No	Diameter cm	Weight kg
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	1	3.0	0	0	0
5	1	1.86	1	38.0	0.92
6	3	2.53	1	34.0	0.63
			1	27.0	0.40
7	3	2.85	1	54.0	2.47
			1	44.0	1.29
8	4	4.06	1	66.0	4.06
			1	47.0	1.56
			2	Immature	Immature
9	2	2.20	1	Immature	Immature
10	1	4.25	0	0	0
11	1	3.10	0	0	0
12	4.	4.68	1	55.0	3.12
			1	43.0	1.51
13	2	2.40	1	53.0	2.40
14	2	4.12	1	57.0	2.78
			1	40.0	1.13
15	3	4.00	1	58.0	2.41
			1	34.0	0.63
16	8	4.50	1	60.0	2.98
			1	46.0	1.50
			1	35.0	0.87
17	6	4.10	1	42.0	1.13
			1	Immature	Immature
18	4	3.00	1	Immature	Immature
19	3	4.25	1	43.0	1.18
			1	35.0	0.75
			1	39.0	1.02
20	3	4.70	1	41.0	1.08
			1	24.0	0.28
21	4	3.60	1	33.0	0.59
			1	38.0	0.82
22	4	4.33	1	48.0	1.81
			1	49.0	1.68
23	7	3.45	1	50.0	2.30
			1	37.0	1.03
			2	Immature	Immature
24	5	4.00	1	64.0	3.64
25	3	2.75	1	46.0	1.77
			1	48.0	1.57
26	4	5.50	1	47.0	1.78
			1	43.0	1.51
27	4	5.20	1	56.0	2.29
			1	42.0	1.33
			1	30.0	0.70
28	6	3.03	1	49.0	2.26
			1	41.0	1.13
			1	35.0	0.62
29	6	4.43	1	47.0	1.71
			1	43.0	1.38
30	6	4.44	2	Immature	Immature
31	3	3.66	2	Immature	Immature
32	4	4.30	1	45.0	1.45
			1	56.0	2.51
			1	41.0	1.15
			1	Immature	Immature
33	7	3.42	1	46.0	1.54
			1	40.0	1.04
			1	34.0	0.56
34	4	3.5	1	66.0	4.35
			1	52	2.07
35	4	4.25	1	50.0	2.25
36	3	3.50	1	55.0	2.90
			1	73.0	5.18
37	7	3.52	1	47.0	1.99
			1	38.0	1.19
38	1	3.40	1	33.0	0.73
39	4	5.0	1	50.0	1.56
40	4	4.80	1	53.0	1.93
			1	51.0	1.40
			1	40.0	1.19
			1	34.0	0.57
			1	Immature	Immature
41	3	4.60	1	57.0	2.55
42	3	3.0	1	60.0	3.10
43	4	3.35	1	52.0	2.18
			1	Immature	Immature
44	4	4.18	1	43.0	1.45
			1	51.0	2.29
			1	39.0	1.11
45	4	4.30	1	51.0	2.40
46	4	5.80	1	54.0	2.39
			1	49.0	1.56
			3	Immature	Immature
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0
TOTAL	163	-	87 (from which 17 immature)	-	120.61 kg

From the total of 50 nests, we obtained 70 fruits that reached maturity and a total production of 120.61 kg. The fruits were analysed by ICA Research and Development Laboratory and the general physic-chemical analyses revealed: ash – 0.26%; carbohydrates – 1%; protein – 1%.

CONCLUSIONS

The main conclusion of our field experiment is that the Benincasa Hispida plant can be adapted to the pedoclimatic conditions of our country with good technological performances. To promote this plant like an opportunity in our country the research has to be continued by taking into consideration different types of soil and climatic conditions.

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