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RESEARCHES REGARDING THE BEHAVIOUR OF LOCAL ECHALOTTE ONION POPULATIONS IN PRAHOVA COUNTY IN ORDER TO PRESERVE THE GERMPLASM RESOURCES

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Abstract

Echalotte onion is a species of onion cultivated in the past to supply the family need. Nowadays, its popularity and usage decreased dramatically in Romania. Worldwide, echalotte onions have a generally recognized position on the vegetable market and this fact represented the main cause for the decision to rehabilitate its position also on the Romanian market because the local supermarkets started to import products based on this vegetable. The present paper contains a study regarding many local populations of echalotte onion species (originating from Slon, Drajna and Periş, all with different sized bulbs), cultivated in Valenii de Munte area, an environment with the most appropriate conditions for the onion culture. In what regards the productivity and the vegetative process of the echalotte culture studied, the recorded data were at a satisfactory level, proving the resistance of this species in comparison with the common onion. Therefore, the diameter of leaf rosette registered values of over 20 cm, excepting the local population of Slon onion, with small sized bulb, which registered only 16,5 cm; the height of plants reached more than 40 cm, excepting the local population of Drajna, with small sized bulb, which reached 35 cm; the average weight of bulbs varied between 13,9 g and 15,9 g and the maximum number of bulbils per plant was 16. The largest production was obtained for the onion from Drajna with large bulbs, having a value of more than 25 t/ha.

Key words: *echalotte onion, local populations, production*

INTRODUCTION

Echalotte onion originates from the regions surrounding the Mediterranean Sea. It can be found as a wild species in Oriental Asia and Near East (Ceauşescu 1984, Indrea 2007). It has been cultivated for long, but only in the 16th century did J. Bauhin mention it under the name of *fertilis* onion. Nowadays, echalotte onion is cultivated on large areas in China, Japan, countries of the former USSR as well as in Western Europe. In our country, it is cultivated on smaller areas, especially in Transylvania, Subcarpathian regions from Muntenia and Oltenia and Northern Moldova.

Echalotte onion is cultivated for its bulbs and leaves. The bulbs are used at obtaining a large variety of dishes as well as in can industry. The leaves are used during early spring in salads and specific dishes (cooked green onion). Green onions are also used for fresh consumption. Moreover, the bulbs are smaller and hotter, similar to the ones from common onion, and are used to spice dishes and vegetable cans.

In addition to the large quantities of nutrients (1- 2% proteins, 5-12% carbon hydrates, 0,2% fats, calcium, iron, potassium minerals, B_1, B_2 vitamins), the onion contains also volatile substances called ”phytoncids”, which have antibiotic characteristics.

The therapeutic effect is given by the forerunners of the aromatic substances, which are the important “warehouses for sulfur compounds” that have a strong antibacterial and antifungal effect. Onion is recommended for preventing and treating atherosclerosis and coronary diseases and for decreases in the level of blood cholesterol. Onion and garlic extracts are recommended for treating diabetes, cancer and asthma. The volatile aromatic compounds from the echalotte onion bulbs and seeds have

strong effects on other organisms (Hoza 2003). Thus, they can be toxic for certain fungi, parasite bacteria and nematodes. The experiments "in vitro" demonstrated that the onion and garlic extracts inhibited more than 80 species of pathogenic fungi – allicin could be recommended as fungicide.

MATERIAL AND METHOD

The experiment was conducted in Drajna village, Prahova County. Drajna is located in the northern part of the Prahova County, being situated in the depression Drajna – Chiojd, in its south-western part; the depression comprises line hilly parts at the contact with Teleajen Valley.

The research was conducted by using five local echalotte onion populations, with different origins, during 2011 – 2012 with the following experimental scheme:

- V1 – onion from Slon, with small bulbs
- V2 - onion from Slon, with large bulbs
- V3 – from Periş
- V4 – from Drajna, with small bulbs
- V5 - from Drajna, with large bulbs

The planting was done in the first decade of April.

The planting scheme for the echalotte onion included a distance of 20 cm between rows and 15 cm between bulbs on the rows. The planting depth was 3-4 cm.

During the research conducted with the five local echalotte onion populations, maintenance works was performed, specific for the onion culture. Moreover, observations and measurements were made regarding the growth of the plants expressed through their height, the diameter of the leaf rosette, diameter of bulbs, average weight of bulbs and small bulbs, average weight of the green onion strain formed from bulbs and small bulbs, number of bulbils formed per plant, the onion production etc.

RESULTS OBTAINED

The diameter of the echalotte onion bulbs was slightly different among the two years. In the first year, the local populations of onion from Slon with small bulbs, from Periş and from Drajna with small bulbs formed bulbs with less than 2 cm in diameter, while in the second year the diameter was greater than 2 cm, only the population from Periş having 2 cm in diameter (Fig.1).

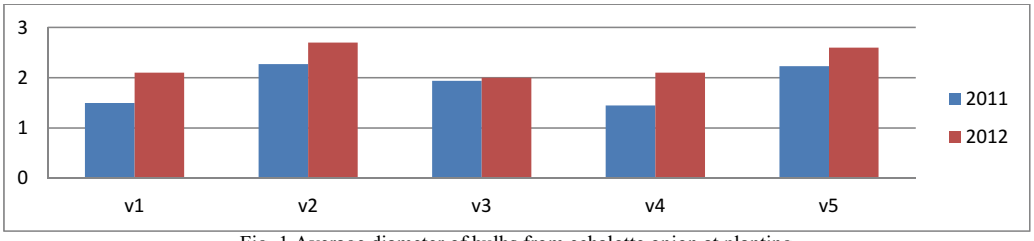

Fig. 1 Average diameter of bulbs from echalotte onion at planting

The average weight of the green onion strains/bulbs differed among the two years, due to the fact that in 2012 the climatic conditions were more favorable than in 2011. In 2012, the amount of rainfall was greater, the temperatures began increase when the plants had already begun to form bulbs and needed long days. There were no conditions to favor the appearance of manna. As a result of this, the echalotte onions were more vigorous in 2012 and had a bigger weight than in 2011 (Fig.2).

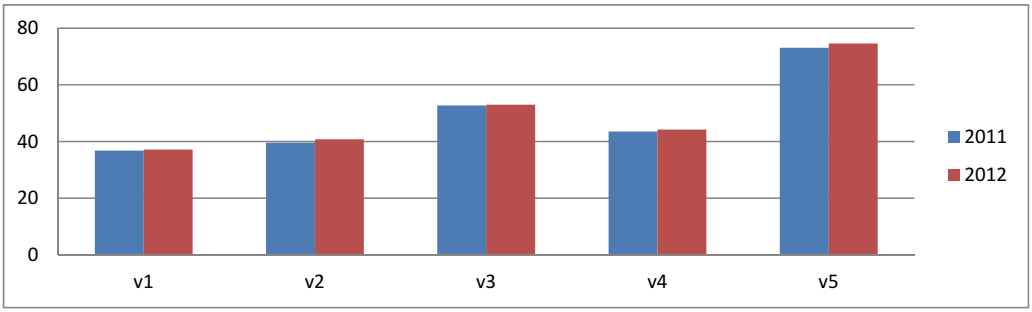

Fig. 2. Average weight of green onion strains/bulbs

The average weight of the green onion strains/bulbs was different for the two years, because the same conditions that influenced the weight of the green onion strains also influenced the weight of each green onion plant (Fig.3).

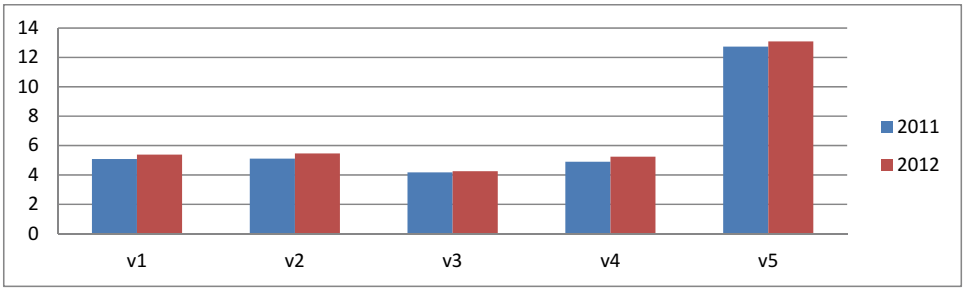

Fig. 3. Average weight of the green onion strains/bulbils

The dynamics of the leaf rosette was another indicator that differed among the two years, because the climatic conditions were more favorable in 2012 and greatly influenced the development of the echalotte onion. From the table below it can be observed that in 2012 the diameter of the leaf rosette recorded values similar to the ones from 2011, but 16 days earlier. Thus, in 2012, the echalotte onion had a much better development than in 2011 (table 1). The dynamics of the height of echalotte onions also varied among the two years mostly due to the fact that 2012 was a more favorable year from a climatic point of view, influencing greatly the development of the plants. From the table below (table 2) it can be noticed that in 2012 the measurements were made 16 days earlier than in 2011, due to the specific climatic conditions; however, the plants had a very good growth, some local onion populations recording values similar to the values from the previous year.

Table 1. Dynamics of the leaf rosette diameter, cm

Variant	2011	2012
1	15.59(21.05)	5.76(05.05)
2	17.57(28.05)	11.54(13.05)
3	19.66(04.06)	19.60(27.05)
4	20.71(18.06)	20.46(02.06)
5	21.19(25.06)	21.15(09.06)

Table 2. Dynamics of the echalotte onion height, cm

Variant	2011	2012
1	26.8(21.05)	15.4(05.05)
2	31.0(28.05)	19,8(13.05)
3	34.0(04.06)	27.8(27.05)
4	36.6(18.06)	33.8(02.06)
5	40.0(25.06)	41.2(09.06)

The average number of bulbils for the local echalotte onion populations varied. The highest number of bulbils was recorded for the local population of onion from De Periş, with 16 bulbs, while the lowest number was recorded for the onion from Slon with large bulbs with only 3 bulbs. The rest of the local population recorded intermediary values, their average being 8 bulbs (Fig.4).

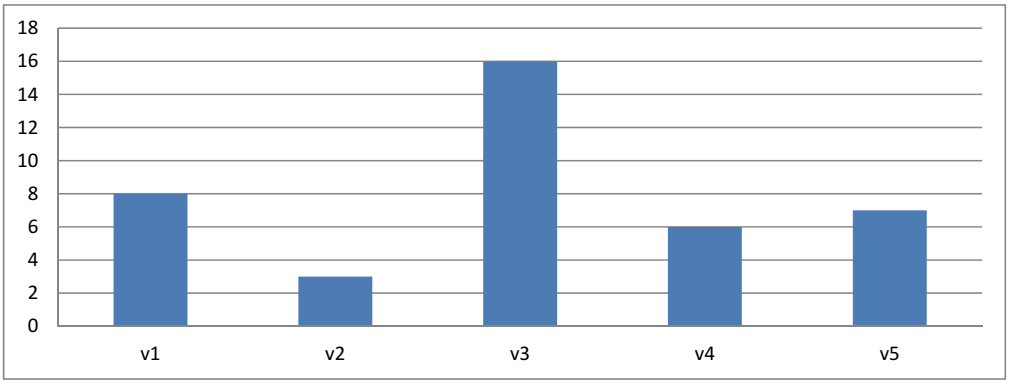

Fig. 4. Average number of bulbils (average data 2011-2012)

The average weight of the bulbils at harvest differed among the onion populations. The biggest weight of the bulbils at harvest was recorded for the onion from Drajna, with large bulb, having a value of 15,9 g, while the lowest value was recorded for the local population of onion from Periş, having only 4,5 gr. The remaining populations recorded intermediary values, having a mean weight of 10,12 g (Fig.5).

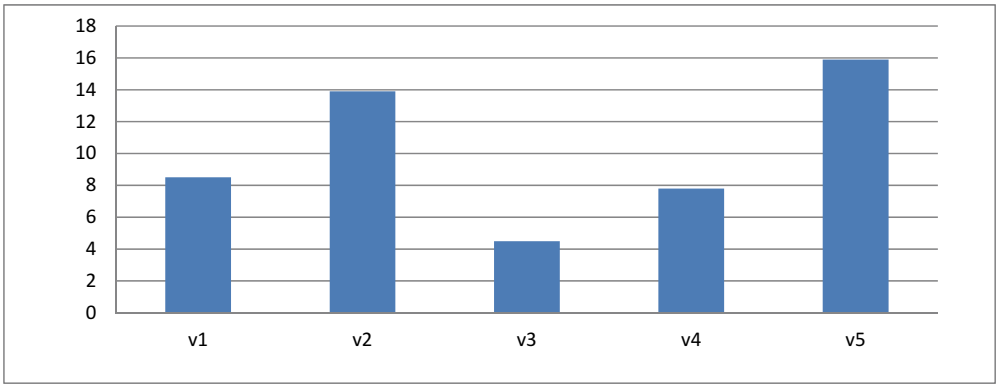

Fig. 5. Average weight of bulbils at harvest

The average weight of the bulbs at harvest was also different. The biggest weight was recorded for the population from Drajna with large bulbs with a value of 102.5 g, while the lowest weight was recorded for the onion from Slon with large bulbs, having a value of only 43.6 g. The remaining echalotte onion populations recorded intermediary values, having an average weight of 68.28 g (fig.6).

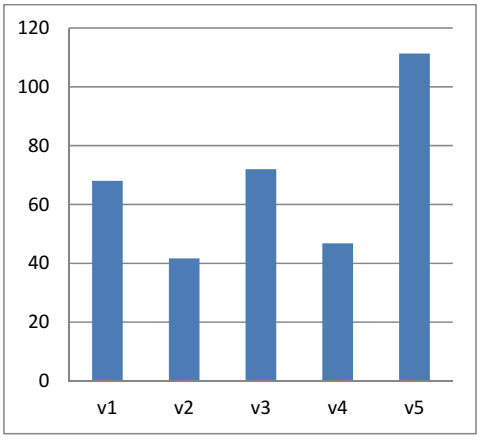

Fig. 6. Average bulb weight at harvest

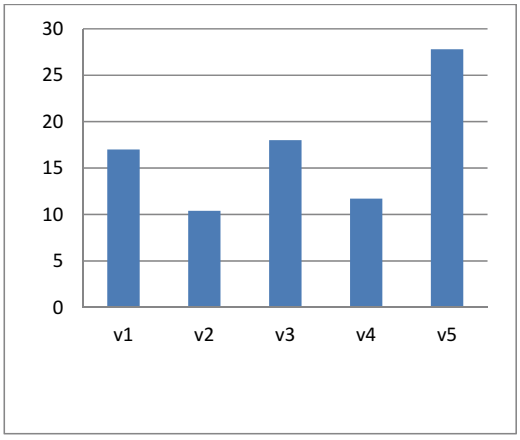

Fig. 7. Echalotte onion production, t/ha

The echalotte onion production per hectare varied according to each local population. Thus, the population with the largest production was the onion from Drajna with large bulbs, recording a production of 25,62 t/ha, while the population with the lowest production was the onion from Slon with large bulbs, producing only 10,9 t/ha. The remaining populations recorded intermediary values between 12,32 t/ha and 18,77 t/ha.(fig.7)

CONCLUSIONS

The echalotte onion cultivated in Văleni de munte area recorded very good results, being supported by the research conducted during 2011-2012. From this research, the following conclusions can be drawn:

- Echalotte onion has a better resistance than common onion and can be used as green onion and as onion for buls.
- In order to obtain onion for bulbs from echalotte onion, plants from Slon, with large bulbs can be used, because these plants recorded average weights of 13,9 g, and also onions from Drajna with large bulbs, which have an average weight of 15,9 g. These variants form on average 5 large bulbs.
- In order to obtain onions for leaves, it is recommended to use onion from Periş, because it forms 16 bulbs with an average weight of 4,5 g. At the same time, local populations from Slon and from Drajna with small bulbs can also be used, which have on average 7 bulbs with weights of 8,5 g and 7,9 g respectively.

Foto 1. Green echalot onion

Foto 2. Mature echalot onion from Periş

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