MORPHOLOGICAL AND PHYSIOLOGICAL CHARACTERISTICS OF THE SPECIES *ORIGANUM VULGARE* L. IN ORGANIC GROWING CONDITIONS IN THE COUNTY OF IASSY

CARACTERISTICI MORFOLOGICE ŞI FIZIOLOGICE ALE SPECIEI *ORIGANUM VULGARE* L. ÎN CONDIŢII DE CULTIVARE ECOLOGICE ÎN JUDEŢUL IAŞI

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Abstract. *The paper highlights the main morphological and physiological characteristics of the species Origanum vulgare L. in organic growing conditions in the county of Iassy. The results show that under these conditions the plant has a typical morphology and physiology with some deviations on the habitus of the plant, vegetative mass, the vegetation, flowering, harvest quality. These results demonstrate the species well adapted to natural conditions of the science and efficient cultivation opportunities.*
Key words: *Origanum vulgare*, morphological, physiological.

Rezumat. *Lucrarea prezintă principalele caracteristici morfologice şi fiziologice ale speciei Origanum vulgare L. în condiţii de cultivare ecologice în judeţul Iaşi. Rezultatele arată că planta prezintă în aceste condiţii o morfologie şi fiziologie tipică cu unele abateri privind habitusul plantei, masa vegetativă, pornirea în vegetaţie, înfloritul, calitatea recoltei. Aceste rezultate demonstrează buna adaptare a speciei la condiţiile naturale din zona Iaşi, precum şi posibilităţile de cultivare eficientă.*
Cuvinte cheie: *Origanum vulgare*, morfologie, fiziologie.

INTRODUCTION

Oregano (*Origanum vulgare* L.) is a native species from the Europe (Mediterranean region), southern and central Asia. The most important species of oregano have the origin from high altitude mountain areas in the Mediterranean region, the plant is common in Greece, Asia Minor, Italy and even in the Balkans (Sarlis G., 1994). This species is known in Romania, both spontaneous and the cultivated. The area planted with oregano is relatively low: in small farms, in private collections, research establishments or in some companies with concerns for the spicy, aromatic and medicinal crop (Fălticeanu Marcela, N. Munteanu, 2003).

Technical knowledge about the culture of oregano are relatively low, and written, for the most part, are takeovers of foreign literature.

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Knowledge of the main agrobiological characteristics related to plant morphology and physiology, agrotechnic and cultivation technology, is essential to promote, on a scientific basis, this culture. Therefore, the purpose of this paper is to highlight some of the morphological and physiological features of this culture in order to optimize the cultivation technology (Stan and Munteanu, 2001).

MATERIAL AND METHOD

The research was conducted at the Faculty of Horticulture organized on the basis of experience in the experimental field of vegetable discipline during 2009-2010, established a culture of oregano in the previous year.

Culture was established by 40-45 days seedling, planted in the last decade of April, with rows spaced 70 cm and a distance between plants in the row of 30 cm (4.8 plants/m2).

Care work are those recommended in the literature. During the vegetation period, observations and measurements were made on the main biometric characteristics morphophysiological with special reference to: the vegetation, plant height, plant diameter, branch and main phenophase. The flowering period were sampled for determination of leaf pigments using spectrophotometry.

The experimental data were processed by statistical and mathematical methods.

RESULTS AND DISCUSSIONS

Results were analysed and compared to the years 2009 and 2010.

In 2009 (table 1), the plants were growing in the second year, entered into between 10-15 March and vegetation began to flourish in the 14-20 June and flowering lasted about three weeks.

Table 1

Results on the dynamics of *Origanum vulgare* L. plants in 2009

Date of measurement	Plant height (cm)	Bush diameter (cm)	Number of tillers/plant	Vegetative mass (g)	Phenophase
8.04. 2009	22	65-70	80	1200	issue sprouts
3.05.2009	40-45	72-75	85	1800	floriferous stems issue
3.06.2009	50-55	77-80	95	2900	flower buds
3.07.2009	55-60	80-85	95	3500	full flowering

The first harvest was made on 12 July. Following harvest was obtained 16.8 t/ha of fresh vegetative mass, after drying were obtained 4.2 t/ha vegetative dry mass. Drying efficiency was 4 kg to 1 kg fresh vegetative dry vegetation.

The second harvest was made on 30 September when the harvest was obtained fresh vegetative weight 1.07 t/ha, respectively 0.3 t/ha of dry vegetative mass, drying the resulting yield was 3.9 kg for 1 kg fresh vegetative dry vegetation.

In 2010 (table 2), plants have entered the vegetation period March 20 to 25 and began to flourish during the period June 20 to 25. The flowering lasted about three weeks. The first harvest was made on July 20.

Following harvest were obtained 22.5 t/ha fresh vegetative mass, obtained after drying were 5.76 t/ha dry vegetative mass. Drying efficiency was 3.9 kg to 1 kg fresh vegetative vegetative dry mass. A second harvest was made on 25 September when fresh harvest was obtained 1.44 t/ha, respectively 0.36 t/ha dry, in which case the yield was the same as the first harvest, 3.9 kg of mass 1kg fresh vegetative mass for dry vegetation.

Table2

Results on the dynamics of *Origanum vulgare* L. plants in 2010

Date of measurement	Plant height (cm)	Bush diameter (cm)	Number of tillers/plant	Vegetative mass (g)	Phenophase
8.04. 2010	15	60-64	96	2300	issue sprouts
3.05. 2010	44-48	75-80	100	3700	floriferous stems issue
3.06.2010	60-65	85-90	110	4300	flower buds
3.07.2010	75-80	95-100	110	4600	full flowering

Mean experimental results obtained in the two years 2009 and 2010, are presented graphically in figures 1, 2 and 3. Regarding plant height, we can say that it shows a significant increase in the last phenophase height compared to the plants phenophase issued shoots.

Thus, in 2009, plant height had values ranging from 22 cm, in shoots and 55-60 cm. phenophase issue when the plants were in full bloom period. Assigned range in plant height in 2010 ranged between 15 cm. and 75-80 cm. in the first phenophase at full flowering. Average values for the two years ranged from 18.5 cm., during the period when the plants were given full, flowering shoots and 67.5 cm.

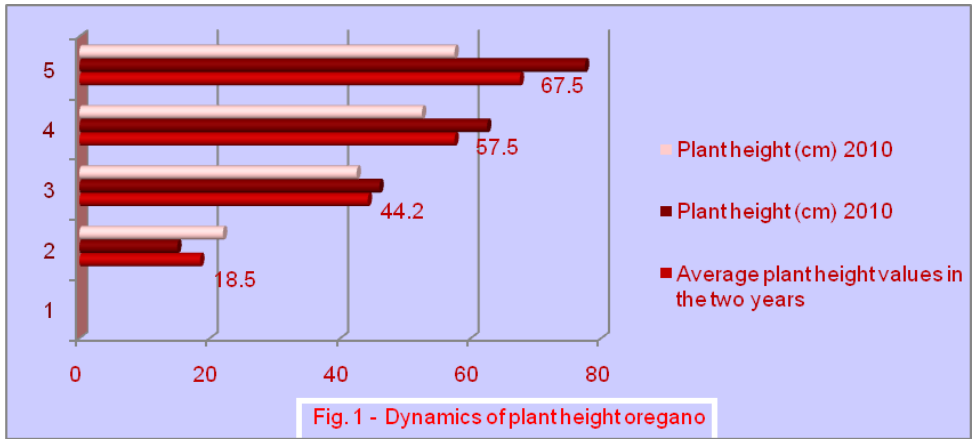

Fig. 1 - Dynamics of plant height oregano

The following graph, the diameter growth of the bush, we have values higher in the third year of crop plants, compared to the second year in most phenophase except phenophase issue of shoots, where you can see a decrease in the diameter of the bush. Average values recorded on the two years is between 64.75 cm. in the plants issued phenophase shoots and flowering phenophase 90 cm.

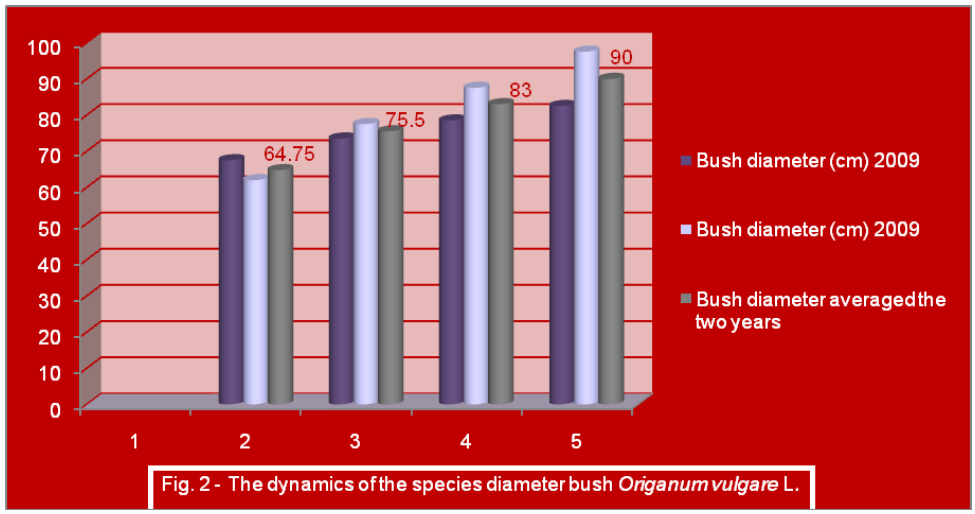

Fig. 2 - The dynamics of the species diameter bush *Origanum vulgare* L.

As the number of shoots, it appears that it has made quite different, increasing from one year to another, indicating that in the last two phenophase values stabilized. Average number of shoots recorded values, the two-year period was 88 when the plants emit sprouts, 92.5 in issuing phenophase floriferous stems and 102.5 both during floral bud formation and at full flowering.

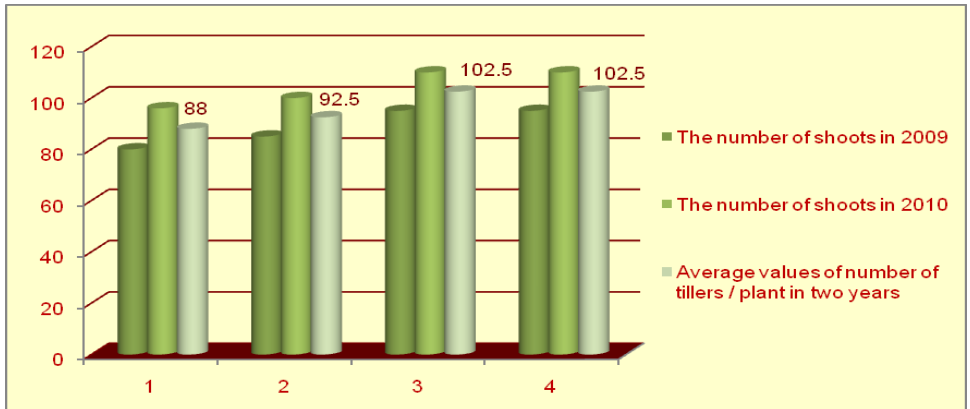

Fig.3 - Number of tillers /plant the species *Origanum vulgare* L.

Qualitative and quantitative analysis of foliar pigment content, assessed by ability to absorb UV light in the visible spectrum and shows differences between the categories of plant pigments in the oregano.

Chlorophyll a 663-664, had average values of 1.83, considered high value, which shows a good adaptability of the species in experimental conditions. Knowing that a plant is heliofill oregano (fig.4). *453-454 chlorophyll b* has values ranging around 2.98 absorbance units, and chlorophyll a 434-435 has an average value of 4.68 absorbance units, demonstrating good light absorption capacity by plants.

Flavonoid pigments have an average of 6.03. Based on these values we can evaluate the strength of plant organs adverse environmental conditions.

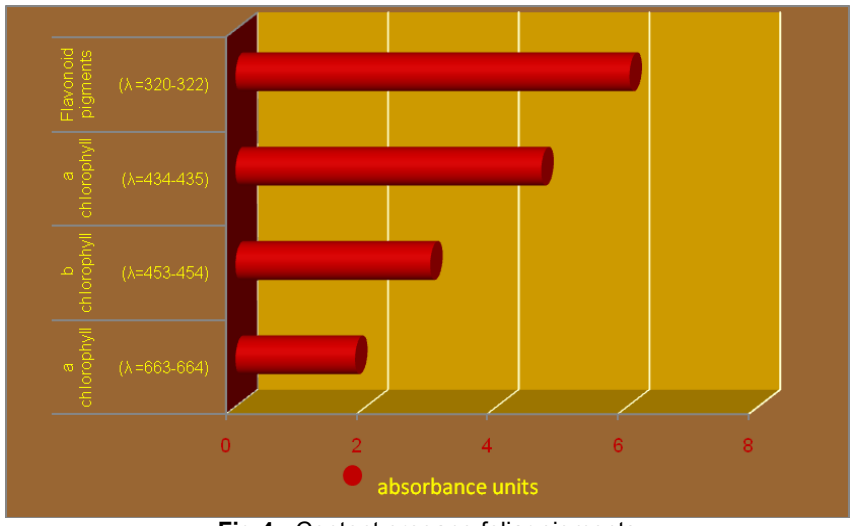

Fig.4 - Content oregano foliar pigments

CONCLUSIONS

1. The analysis main morphological characteristics (plant height, diameter of the bush and number of tillers/plant), the two years in different phenophase showed a progressive increase from one year to another, the values recorded by them.

2. Yields on these two years, ranged from 16.8 t/ha in 2009 to 22.5t/ha 2010.

3. Content in chlorophyll pigments and flavonoids of plants, is located at a high level, demonstrating the photosynthetic capacity and high adaptation.

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