

## CONTRIBUTIONS REGARDING THE INFLUENCE OF THE CULTURE ESTABLISHING MANNER ON SOME MORPHOLOGICAL CHARACTERS FROM SOME *MONARDA* L. SPECIES

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### Abstract

The study follows the influence of the culture establishing manner on three morphological characters (plant height on full blossom phenophase, length and width of the leaves) from three species of the genus *Monarda* L. cultivated in Moldova, in the year 2013. The experience was conducted in three locations of Moldova (Iasi, Vaslui and Pojorata) including variants established by seed, and variants established by seedling. After observation and biometric measurements, it was found that the seedling established variants had higher values of the characters followed during the plant vegetation period.

**Key words:** *Monarda*, seedling, seeds.

*Monarda* L. genus is placed in the botanical family Lamiaceae, comprising a total of about 12 plant species (Gusuleac M., 1961) popularly known as bergamot, Indian mint, decorative mint.

### MATERIAL AND METHOD

The experiments were conducted in three areas of Moldova pedo-climatic conditions: the experimental field of the Department of Crop Production, within USAMV Iași, the experimental field of Văleni, Vaslui county and the experimental field of Agricultural Research and Development Station Suceava-Pojorâta center.

The experiments were established in the spring of 2011 and 2012 located in subdivided plots in three repetitions, with variants established by seeds and variants established by seedling obtained in the greenhouse of the USAMV Iași Didactic Station.

Experimental factors investigated were:

Factor A – Area; a1- Pojorata area, a2-Iasi area and a3- Vaslui area

Factor B – Species; b1- *M. citriodora* Cerv. ex Lag., b2- *M. didyma* L. și b3- *M. fistulosa* L.

Factor C - The culture establishment manner of, c1-by seeds and c2-by seedling.

Sowing was done in all three location in May and plant emergence occurred in about 3 weeks. Seedling was planted in the same month, with a height of 14 cm, at a distance of 40 cm between plants in the row and 50 cm between rows.

The biological material used in the experimental field setting is represented by three species of the genus *Monarda* L., *M. didyma* L., *M. fistulosa* L. and *M. citriodora* Cerv. ex. Lag. *Monarda citriodora* Cerv. Ex. Lag is an annual species, with heights of 25-90 cm, well-developed root system, swivel type, branched (fig. 1) Stems are branched, tetraedged, pubescent.

The leaves are opposite, petiolate lanceolate or oblong-lanceolate, pubescent, with serrated edges, with a strong lemon scent.

Flowers, pink-purple, are grouped in whorls 2-7 (verticillate) capituliforme terminals, accompanied by colorful bracts; tubular calyx, 5 lobed, bilabial corolla, with long tube, narrow, glabrous inside, straight or slightly curved upper labium, the lower is shorter, of 3 lobes (Gusuleac M., 1961). The fruits are ovoid, glossy nut like.



Figura 1 *Monarda citriodora* Cerv. ex Lag. (original)

*Monarda didyma* L. is a perennial species with flowering period from July to October (fig. 2) The stem is about 100-130 cm tall, branched from the base, forming a clump of straight shoots, tetraedged. The leaves are ovate-lanceolate, petiolate.

The flowers are bilabiate, red, arranged in 1-3 whorls capituliforme terminals, accompanied by colorful bracts.

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Figura 2 *Monarda didyma* L. (original)

*Monarda fistulosa* L. is a perennial species, shrub looking, 35-120 cm high (fig. 3). The stem is simple, erect, hairy, reddish at the top. The leaves are strongly flavored, are large, ovate-lanceolate, petiolate, dentate, 3-10 cm long. The flowers are lilac-purple color, grouped in terminal whorls; the calyx is tubular, 15-nerves, ending with 5 teeth; the corolla is bilabial, 2-3 cm long, pubescent (Elizabeth McClintock, C. Epling, 1942).

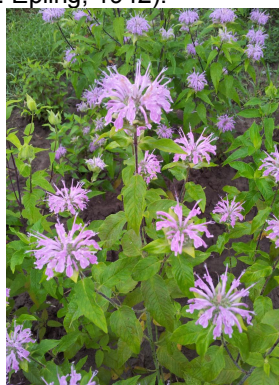


Figura 3 *Monarda fistulosa* L. (original)

## RESULTS AND DISCUSSION

The way that the culture was established determined that plant height at full flowering be 67.01 cm at plants variations established by seed, and 76.23 cm at the plants grown in variants established by seedling, the latter causing significant differences (4.61 cm) than the average of the experiment (fig. 4).

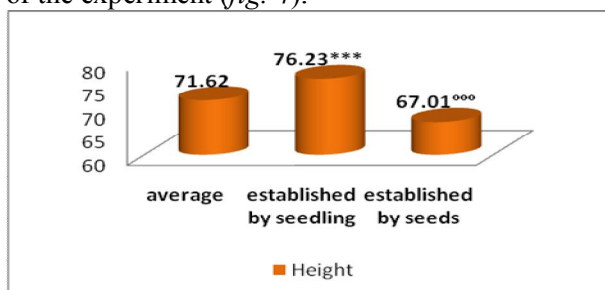


Figure 4. The influence of the way the culture is set up on the height of the three species of Monarda

The interaction between the studied species and the manner of culture establishing determined that in 2013 the experimental plant

height varies from 50.1 cm to *M. citriodora* Cerv plants. Lag ex. of variations established by seed, to 94.97 cm at *M. fistulosa* L. cultivated species variants established by seedling. Significant differences from the average experience (71.62 cm) was obtained from *M. fistulosa* L. plants of the variants created by both seedling and seed and plants of *M. didyma* L. seedling variants obtained (fig. 5).

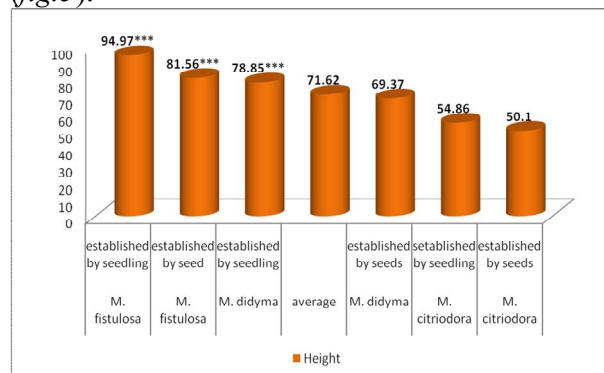


Figure 5. The Influence of the interaction between species and the manner of culture establishment the height at full blossom on the three species in 2013

Plants grown in variants established by seedling in the mountains area of the experience, Pojorîta (Suceava County) have measured the greatest height (87.94 cm), with a very significant difference from the average experience (71.62 cm). In contrast, plants of the variants obtained by direct sowing in the experimental field of Vaslui have reached the lowest height (57.14 cm), resulting in a very significant negative difference from the average experience (fig. 6).

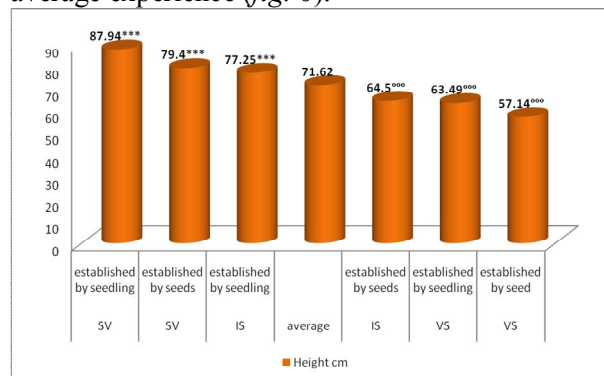


Figure 6. The influence of the interaction between area x establishing manner of the culture on the height at full blossom of on the three species in 2013

Monarda plants cultivated in the variations established by seedling determined leaf length values of 7.64 cm, with a very significant difference from the average experience of 0.29 cm (fig. 7). The leaves of plants of the variants obtained by direct seeding in field had shorter lengths of 7.06 cm, the difference being highly significant less compared to control

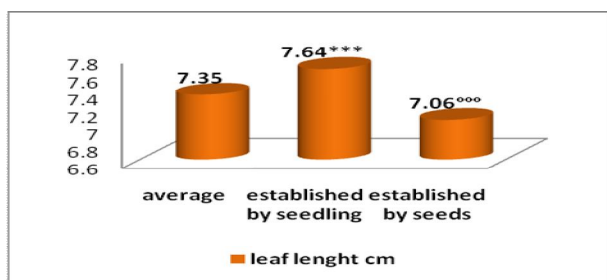


Figure 7. The influence of culture establishing manner on the leaf length on the three species studied in 2013

The interaction between crop species and culture establishing manner determined in the experimental year 2013 that plant leaf length varies from 4.93 cm recorded on species *M. citriodora* Cerv. Lag ex. On variants established by seed, up to 9.07 cm on *M. fistulosa* L. plants of the variants obtained by seedling (fig. 8). Perennials, *M. didyma* L. and *M. fistulosa* L., of the variants obtained by both methods of culture establishing determined significant differences from the average of the experience (7.35 cm) in terms of leaf length.

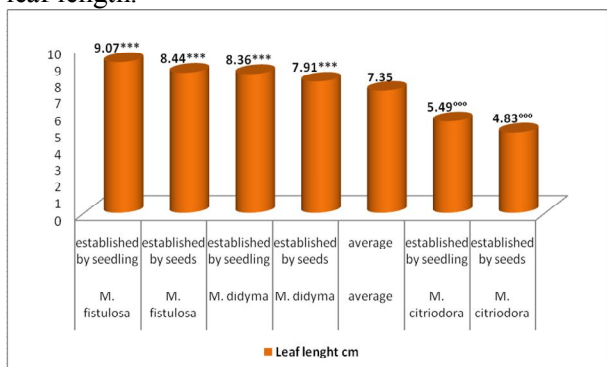


Figure 8. The Influence of the interaction between species x culture establishing manner on leaf length of the three species in 2013

The longest leaves were determined on plants from the variants established by seedling in Pojorîta (7.98 cm) these achieving a significant difference compared to the control (7.35 cm) (fig. 9).

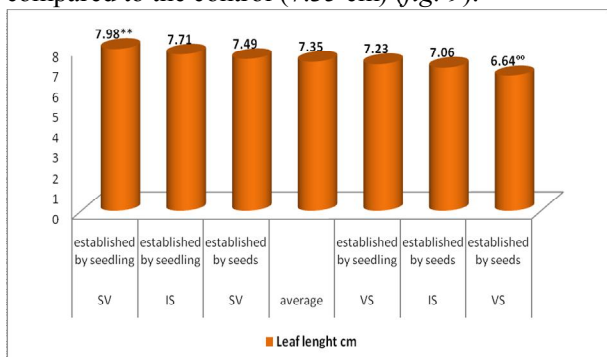


Figure 9. The influence of the interaction between area x culture establishing manner on leaf length of the three species in 2013

The culture establishing manner influenced leaf width in the experimental year 2013, which has an average value of 3.03 cm on the plant variants established by seedling, with a significant

difference of 0.13 cm compared to the average of the experience (2.9 cm), and by 2.77 cm in plants cultivated in the variations created by seed, with a negative significant difference of -1.13 cm, compared to the average (fig. 10).

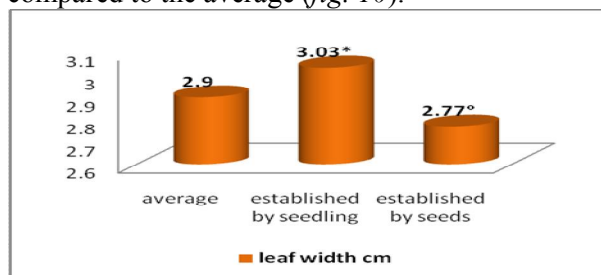


Figure 10. The influence of the culture establishing manner on the width of the leaves from the three species in 2013

Leaf width ranged from 1.2 cm to *M. citriodora* Cerv. ex Lag. plants. from variants established by seed to 4.11 cm at *M. didyma* L. from plants variants obtained by seedling (fig. 11). Significant differences compared to the average of the experience was obtained from plants of *M. didyma* L. and *M. fistulosa* L. of variants obtained both by direct sowing in the field and by seedling.

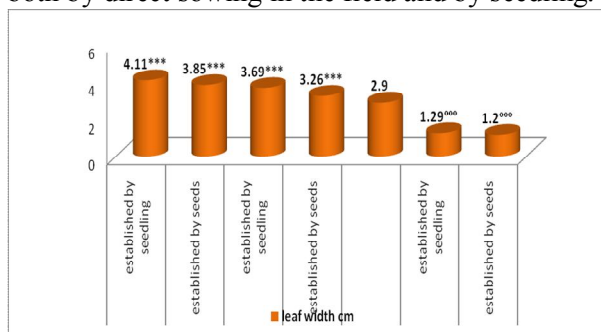


Figure 11. The influence of the interaction between species x culture establishing manner on leaf width on the three species in 2013

Leaf width ranged from 2.62 cm on plants from variations established by seed in the experimental field from Vaslui and 3.18 cm on plants from variants established by seedling in Suceava (Pojorîta) (fig. 12).

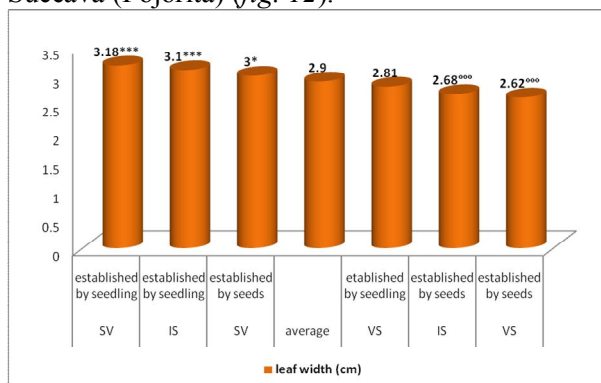


Figure 12. The influence of the interaction between area x culture establishing manner on leaf width of the three species in 2013

## CONCLUSIONS

1. The plants from the variant established by seedling in experimental year 2013 have determined the highest values of morphological characters watched compared to the variants obtained by direct sowing in the experimental field
2. The *M. fistulosa* L. plants of the variants established by seedling had the highest height value measured in the full flowering phenophase.
3. The longest leaves were determined by the plants from the variants established by seedling in Pojorîta (7.98 cm).

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