# STUDY REGARDING THE INTRODUCTION OF LALLEMANTIA IBERICA F. ET M. INTO CULTIVATION ON THE TIMIS COUNTY PLANES

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***Abstract**: Lalemantia iberica is a valuable specie whose seeds contain 26 - 40% oil with high iodine index 162,2 – 202,9 and very dry, in this regard surpassing the linseed oil. The specie has been introduced in Europe from Iran. From the statistical data (V.S. VENŢLAVOVICE, cited by C. COPCARU, 1965) has been cultivated in Ukraine since 1884. Lalemanţia is part of the Labiatae Family, 4 species being know, 2 of them being cultivated: L. Iberica F. et M., şi L. Peltata F. et M. Lallemantia iberica is not very sensitive to heat. The vegetation period is of 70 – 80 days, and the temperature source up to maturity is of 1700˚C. The minimum germination temperature is of 3-5˚C, and the young plants can bear temperature up to minus 7-8˚C, if such low temperatures do not last long time (C. COPCARU, 1965). The humidity requirements are moderate. Excess of humidity make the plans more sensitive to diseases. Regarding the soil, the plant has few requirements; the best results are obtained on chernozem-type soils (N. ZAMFIRESCU şi colab., 1965). We are presenting in our work the results obtained on cambic chernozem soil in the Banat Plane. The research results are proving that it is not a plant having high needs regarding the previous culture. In culture rotation after autumn wheat and corn, there were no differences regarding the signification level. Fertilization with variable doses of nitrogen fertilizers ($N_{20}$, $N_{60}$, $N_{90}$) applied on a constant background of $P_{60}K_{60}$ has positively influence the crop, differences in comparison with the witness lot being significant. Also we present the influence of fertilization on the plants height. The plants have grown proportionally with the nitrogen fertilizer dose, after both previous plants. The weight of 1000 seeds has raise following the fertilization with $N_{90}$, applied on a constant phosphor content of 21%, for wheat – Lallemantia culture rotation and with 6% for corn–Lallemantia. The oil content, in the researched field has been situated between 36,9% and 41,5%. The nitrogen fertilizers have diminished the oil content. The oil quantity, depending on the previous culture and the nitrogen fertilizer dose applied in the context of $P_{40}K_{40}$, has been between 226 kg/ha and 688 kg/ha.*

***Key words**: rotation, fertilization, crop, quality.*

## INTRODUCTION

Cultivation of *Lallemanţia iberica* Fisch et Mey is unknown in our country. Nowadays it is cultivated on small surfaces in some Central European countries and some regions from Russia: Rostov and Saratov. The plant is frequently cultivated in South Europe, Caucasus, Asia Minor (BUIA AL. and colab., 1963). In 2010 A. Zavazi and J.M.S. are mentioning the presence of *Lallemantia species* in Hamadan protected area from Iran. Lao Shu BB, 1994 is describing the species *Lallemanţia* as present in the flora of this country. Knowing the value of this plant, nowadays we consider that there are fine perspectives to extend the cultivated areas.

## MATERIAL AND METHODS

The biological material used by us is from the Faculty of Agriculture from Timisoara, Department of Phytotechnique.

The type of soil used for performing the experiments is cambic chernozem soil (lightly glazed soil), lightly decarbonated, on loessoid deposits.

The experiments have been bi-factorial, the factor A being the previous culture,

having to levels ( $a_1$ – autumn wheat; $a_2$ – corn), and the B factor being the fertilizing level ($b_1$ – $N_0P_{60}K_{60}$; $b_2$ – $N_{30}P_{60}K_{60}$; $b_3$ – $N_{60}K_{60}P_{60}$; $b_4$ – $N_{90}P_{60}K_{60}$).

During the vegetation, we have made determinations regarding plants' height, and during harvesting we have analyzed the weight of 1000 seeds, crop kg/ha, oil content (%) and oil quantity (kg/ha).

## RESULTS AND DISCUTIONS

The crop results are mentioned in Table 1.

*Table 1.*

Crop results obtained on the Timis County planes

| A Factor Rotation | B Factor – N doses on a base of $P_{60}K_{60}$ | | | | A Factor Averages | | | |
|---|---|---|---|---|---|---|---|---|
| | $N_0$ | $N_{30}$ | | $N_0$ | $N_{30}$ | | $N_0$ | $N_{30}$ |
| Wheat | 702 | 886 | 1335 | 1520 | 1110 | 100 | | |
| Corn | 665 | 1008 | 1416 | 1599 | 1172 | 105 | 62 | |

DL 5% = 136 DL 1% =193 DL 0,1% = 280

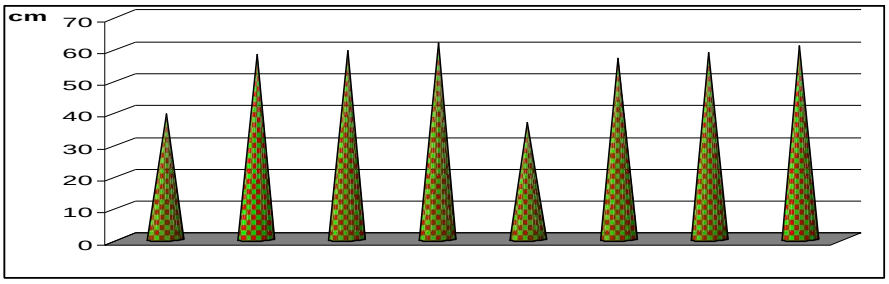
B Factor Averages

| Specification | $N_0$ | $N_{30}$ | $N_{60}$ | $N_{90}$ |
|---|---|---|---|---|
| Yield kg/ha | 683 | 947 | 1375 | 1559 |
| % | 100 | 138 | 201 | 228 |
| Difference kg/ha | | 264 | 692 | 876 |
| Signification | | XXX | XXX | XXX |

DL 5% = 68 DL 1% = 96 DL 0,1% = 140

Depending on the fertilization levels, the average crop levels obtained after cultures of autumn wheat or corn, are similar. The crop differences were not significant, proving that lallemantia is not sensitive to the previous culture.

The nitrogen fertilizers applied in variable doses in the context of a constant level of $P_{60}K_{60}$au have improved the crop, the differences being significant and increasing proportionally with the dose.




| | AUTUMN WHEAT | | | | CORN GRAINS | | | |
|---|---|---|---|---|---|---|---|---|
| | $N_0$ | $N_{30}$ | $N_{60}$ | $N_{90}$ | $N_0$ | $N_{30}$ | $N_{60}$ | $N_{90}$ |
| | $P_{60}K_{60}$ | | | | $P_{60}K_{60}$ | | | |
| $\bar{X}$ | 39,3 | 57,7 | 59 | 61,3 | 36,5 | 56,5 | 58,5 | 60,4 |
| $S^2$ | 27,01 | 11,21 | 17,18 | 18,01 | 8,85 | 12,05 | 7,05 | 5,64 |
| S | 5,2 | 3,35 | 4,22 | 4,24 | 2,97 | 3,47 | 2,66 | 2,37 |
| $S_X$ | 0,52 | 0,34 | 0,42 | 0,42 | 0,30 | 0,35 | 0,27 | 0,24 |
| Sx% | 13,23 | 5,81 | 7,15 | 6,92 | 8,14 | 6,14 | 4,55 | 3,92 |

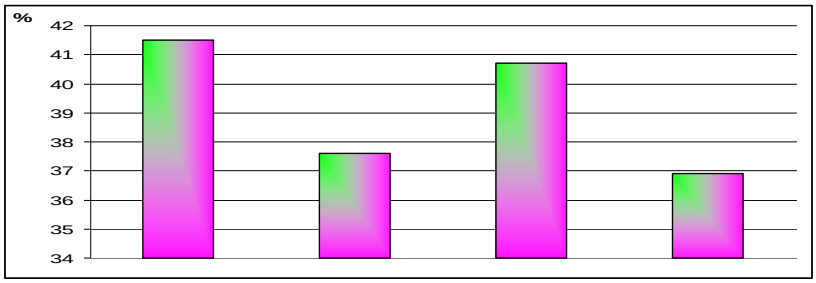
Figure 1. Height variation of plants measured in Timis Plane depending on the previous culture and on the fertilization level

At blooming, we have measured the plants' height, the results being presented in Figure 1. At the culture rotation after wheat, in function of the nitrogen dose, the amplitude of the variation has been between 39,3 cm ($N_0$) and 61,3 cm ($N_{90}$), and after corn between 36,5 cm ($N_0$) and 60,4 cm ($N_{90}$).

The analyzes of the MMB evolution depending on the researched factors is pointing out a value range between 3,7 g ($N_0$) and 4,5 g ($N_{90}$) in rotation after wheat and between 3,4g ($N_0$) and 4.3 g ($N_{90}$) after corn.

The oil content, depending on the studied factors, is presented in Figure 2.

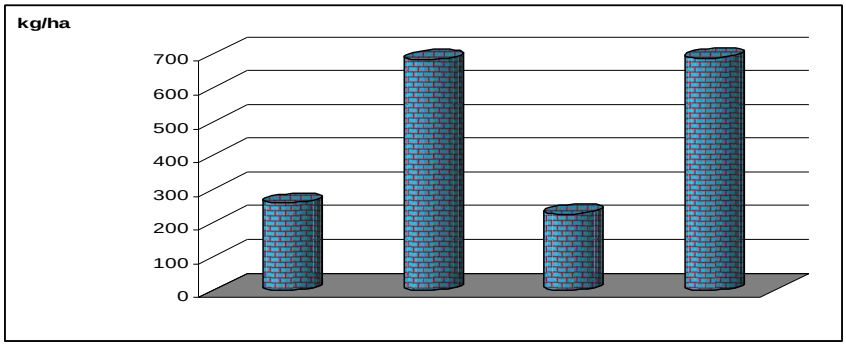
It is found that in case of both previous cultures, the nitrogen fertilization has negatively influenced the oil content, that has diminished in rotation after wheat from 41,5% to 37,6%, and in rotation after corn the reduction has been from 40,7% to 36,9%.




| | WHEAT | | CORN | |
|---|---|---|---|---|
| | $N_0P_{40}K_{40}$ | $N_{90}P_{40}K_{40}$ | $N_0P_{40}K_{40}$ | $N_{90}P_{40}K_{40}$ |
| Content of oil % | 41,5 | 37,6 | 40,7 | 36,9 |
| Difference | | -3,9 | | -3,8 |
| Average of the region | 39,5 | | 38,8 | |

Figure 2. The content of oil measured in the Timis Plane depending on the previous culture and the fertilization level

The oil production, as presented in Figure 3, has been calculated based on the oil content and the seeds production.




| • Quantity of oil kg/ha | • 260 | • 684 | • 226 | • 688 |
|---|---|---|---|---|
| • Nitrogen doses | • $N_0$ | • $N_{90}$ | • $N_0$ | • $N_{90}$ |
| • Previous culture | • WHEAT | | • CORN | |
| • $\bar{X}$ | • 472 | | • 457 | |
| • % | • 100 | | • 97 | |
| • Difference kg/ha | • | | • -15 | |

Figure 3. Quantity of oil obtained in Timis plane, depending on the previous culture and the applied nitrogen fertilizer applied in the context of a constant level of $P_{60}K_{60}$

The results are underlining the favorable effect of fertilization, after both previous cultures. The quantity of protein has raised proportionally with the nitrogen dose applied in the context of $P_{60}K_{60}$, from 260 kg/ha ($N_0$) to 684 kg/ha ($N_{90}$) – for the rotation after wheat - and from 226 kg/ha ($N_0$) to 688 kg/ha ($N_{90}$) in rotation after corn.

**CONCLUSIONS**

*Lallemantia iberica* F. et M. has good climate conditions in Timis Plane that facilitated crops up to 1600 kg/ha.

The crop levels for the culture rotation after autumn wheat and corn, had no significant differences.

The nitrogen fertilizers applied in the context of $P_{60}K_{60}$ have increased production, the differences being significant, and have raised proportionally with dosage for the researched field (N0 – $N_{90}$).

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