# STUDY OF SOME AGROTEHNOLOGICAL CHARACTERISTICS OF CORNSALAD (*VALERIANELLA OLITORIA* MAENCH) IN PROTECTED CULTURE CONDITIONS

## STUDIUL UNOR PARTICULARITĂŢI AGROTEHNOLOGICE LA FETICĂ (*VALERIANELLA OLITORIA* MAENCH) ÎN CULTURA PROTEJATĂ

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***Abstract.*** *The groupe of leafy vegetables are consumed raw, usual in salads, ensuring the full use of vitamins and clorophyll, which have important antianemic and plastic properties. Cornsalad (Valerianella olitoria Maench sin Valerianella locusta* L.*) is a member of this group of leafy vegetables, which in our country is used for consumtion from the spontaneous flora. The experience was conducted in greenhouse belonging to the Vegetable Growing Department of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, in the spring culture in 2009. Were studied the agrobiologic behavior of three varieties of cornsalad like D'Olanda, Volhart and Elan. As experimental factors was used: at first variety, the second factor was the number of seeds/poot and the number of poots/linear meter. Statistical interpretations of obtained results was done by analysis of polyfactorial variance.*

**Key words**: lamb's lettuce, cornsalad, leafy vegetables

***Rezumat.*** *Legumele din grupa verdeţurilor se consumă crude, în salate, asigurând utilizarea integrală a vitaminelor şi a clorofilei, care are importante proprietăţi antianemice şi plastice. Printre aceste verdeţuri se numără şi fetica (Valerianella olitoria Maench sin Valerianella locusta L.) care la noi în ţară se foloseşte pentru consum din flora spontană. Experienţa s-a realizat în sera-solar a Catedrei de Legumicultură în cadrul USAMV Cluj, în anul 2009, în cultura de primăvară. S-a studiat comportarea agrobiologică a trei soiuri de fetică: D'Olanda, Volhart şi Elan. Ca factori experimentali s-a folosit soiul, numărul seminţelor/alveolă şi numărul alveolelor/metru liniar. Interpretarea statistică a rezultatelor obţinute s-a realizat prin analiza varianţei polifactoriale.*

**Cuvinte cheie**: fetică, verdeţuri

## INTRODUCTION

Cornsalad derived from the spontaneous flora, which is found in Europe, North Africa and Western Asia. A vegetable plant is known in Europe and Asia, which spread in culture was achieved in the early twentieth

centuries. Originating in the temperate zone of Europe, was first described in 1699.

In France was cultivated for centuries but in England it was considered a toxic weed, until XIX century (Chaux, Foury, 1994; Rodica Sima, 2007).

In our country is less known and cultivated and for consumption is harvested from spontaneous flora (Ciofu et all., 2003).

Cornsalad is an annual herbaceous plant. The root is pivoting and grow in the surface soil, the vast majority of roots penetrating up to 20-25 cm deep. The leaves are trapped on a short stalk, that can be found in the axillary buds formed side rosettes with small leaves that determine the plant bush aspect (Vákár Andrea Elisabeta, 2002).

Cornsalad have reduced requirements from growth factors, adapting easy to the different variations of soil types and climate conditions.

## MATHERIAL AND METHOD

The experience took place in the unheated greenhouse in the endovment of Vegetable Growing Department at University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca in the spring culture. The experimental factors are:

Factor A – variety, with three graduation:

$a_1$= D'Olanda

$a_2$= Volhart

$a_3$= Elan

Factor B – number of (seeds) plants/poots with three graduation:

$b_1$= 3 seeds

$b_2$= 5 seeds

$b_3$= 7 seeds

Factor C – plant density (number of poots/liniar meter) with two graduation:

$c_1$= 10 poots/lm

$c_2$= 15 poots/lm

By combining the three experimental factors was resulted 18 variants, that were placed in the form of randomized blocks in three repetitions.

The crop establishment was achieved with plant seedlings, which were obtained in alveolar trays, poots (42 wafers) on 02.13.2009. Has been studied the plants development, the final planting was made on 03.24.2009. Plant harvesting was carried out from 20.04.2009 to 05.05.2009. Biometric measurements were conducted to determine growth capacity, number of leaves, leaf rosette diameter, plant weight and plant height and measurements on the production.

## RESULTS AND DISCUSSIONS

The obtained results show that the varieties have the same behaviour, decreases in leaf number variants with higher density, thereby influencing plant and weight (table 1).

From the three varieties remarkable is D'Olanda variety and Elan, whose makes an average weight of 30.99 and 30.60 g., variants with higher density (7 seeds and 15 poots/lm). It was found that the variety Elan, also has a better growth, regardless of number of seeds and respectively plant density.

*Table 1*

**Plant growth and development**

| Variant | | Number of plants/poots | Number of poots/lm | Average number of leaves/plant | Average weight / of plants (g) |
|---|---|---|---|---|---|
| Variety | | | | | |
| V1 | D'Olanda | 3 | 10 | 28 | 20.57 |
| V2 | D'Olanda | 3 | 15 | 30 | 24.11 |
| V3 | D'Olanda | 5 | 10 | 26 | 36.81 |
| V4 | D'Olanda | 5 | 15 | 20 | 22.49 |
| V5 | D'Olanda | 7 | 10 | 22 | 39.88 |
| V6 | D'Olanda | 7 | 15 | 18 | 30.99 |
| V7 | Volhart | 3 | 10 | 34 | 25.81 |
| V8 | Volhart | 3 | 15 | 32 | 20.59 |
| V9 | Volhart | 5 | 10 | 30 | 26.09 |
| V10 | Volhart | 5 | 15 | 28 | 21.64 |
| V11 | Volhart | 7 | 10 | 22 | 24.84 |
| V12 | Volhart | 7 | 15 | 20 | 19.13 |
| V13 | Elan | 3 | 10 | 32 | 32.90 |
| V14 | Elan | 3 | 15 | 32 | 21.22 |
| V15 | Elan | 5 | 10 | 30 | 35.01 |
| V16 | Elan | 5 | 15 | 26 | 30.76 |
| V17 | Elan | 7 | 10 | 26 | 33.81 |
| V18 | Elan | 7 | 15 | 22 | 30.60 |

Production data was interpreted statistically by analysis of variance. Were studied the influence of factors; variety (table 2), number of plants/lm (table 3) and number of poots/lm (table 4). From data presented in table 2, it appears that production was between 1.78 kg/m$^2$ to 2.56 kg/m$^2$ at variety D'Olanda and Volhart, without significant variation of production. From the data presented it appears that the production obtained is influenced more by number of plants/poot and number of poots/lm.

*Table 2*

**Variety influence on production**

| Variant / Variety | Production kg/m$^2$ | Production % | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|
| D'Olanda | 1.78 | 100.0 | 0.00 | - |
| Volhart | 2.56 | 143.8 | 0.78 | - |
| Elan | 2.52 | 141.8 | 0.74 | - |

LSD 5% 0.95 kg/m$^2$ LSD 1% 1.57 kg/m$^2$ LSD 0.1% 1.93 kg/m$^2$

*Table 3*

**The influence of number of plants/pot on production**

| Variant Number of plants/poots | Production kg/m$^2$ | Production % | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|
| 3 | 1.71 | 100.0 | 0.00 | - |
| 5 | 2.29 | 134.5 | 0.59 | *** |
| 7 | 2.85 | 167.3 | 1.15 | *** |

LSD 5% 0.27 kg/m$^2$ LSD 1% 0.38 kg/m$^2$ LSD 0.1% 0.54 kg/m$^2$

The number of plants/poot is crucial, and a greater number of plants provide a higher output from 34.5 % to 67.3 % from control of experience. The large number of poots/lm positively affects the obtained production by achieving a production increase of 25.1 % (table 4).

*Table 4*

**The influence of number of pots/lm on production**

| Variant Number of poots/lm | Production kg/m$^2$ | % | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|
| 10 | 2.03 | 100.0 | 0.00 | |
| 15 | 2.54 | 125.1 | 0.51 | *** |

LSD 5% 0.12 kg/m$^2$ LSD 1% 0.17 kg/m$^2$ LSD 0.1% 0.23 kg/m$^2$

Interaction between factors is another way to study in detail the effects of factors on cornsalad culture (table 5, 6, 7, 8).

*Table 5*

**Variety and number of plants/poot influence on production**

| Variant Variety | Number plants/poot | Production kg/m$^2$ | % | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|---|
| D'Olanda | 3 | 1.41 | 100.0 | 0.00 | - |
| Volhart | 3 | 1.68 | 119.3 | 0.27 | - |
| Elan | 3 | 2.03 | 143.9 | 0.62 | - |
| D'Olanda | 5 | 1.66 | 117.7 | 0.25 | - |
| Volhart | 5 | 2.81 | 199.2 | 1.40 | * |
| Elan | 5 | 2.42 | 171.6 | 1.01 | - |
| D'Olanda | 7 | 2.27 | 160.9 | 0.86 | - |
| Volhart | 7 | 3.18 | 225.5 | 1.77 | ** |
| Elan | 7 | 3.11 | 220.5 | 1.70 | ** |

LSD 5% 1.02 kg/m$^2$ LSD 1% 1.64 kg/m$^2$ LSD 0.1% 1.96 kg/m$^2$

In the case of interaction between variety and number of plants/poot, Volhart and Elan with the highest number of plants/poot (7 plants/poot) recorded the largest increase of production, by 125.5 % and 120.5 % from control of experience (table 5). Concerning the influence of variety and number of poots/lm the achieved production was positively significant for higher density.

*Table 6*

**Variety and number of poots/lm influence on production**

| Variant Variety | Number of poots/lm | Production kg/m$^2$ | % | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|---|
| D'Olanda | 10 | 1.64 | 100.0 | 0.00 | - |
| Volhart | 10 | 1.91 | 116.0 | 0.27 | * |
| Elan | 10 | 2.27 | 138.4 | 0.63 | *** |
| D'Olanda | 15 | 2.84 | 173.1 | 1.20 | *** |
| Volhart | 15 | 2.17 | 132.3 | 0.53 | *** |
| Elan | 15 | 2.87 | 175.0 | 1.23 | *** |

LSD 5% 0.21 kg/m$^2$ LSD 1% 0.29 kg/m$^2$ LSD 0,1% 0.40 kg/m$^2$

*Table 7*

**The influence of number plants/poot and number poots/lm on production**

| Variant | | Production | | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|---|
| Nr. pl/ poot | Nr.poots /lm | kg/m$^2$ | % | | |
| 3 | 10 | 1.54 | 100.0 | 0.00 | - |
| 5 | 10 | 2.01 | 130.1 | 0.46 | ** |
| 7 | 10 | 2.54 | 164.6 | 1.00 | *** |
| 3 | 15 | 1.87 | 121.4 | 0.33 | - |
| 5 | 15 | 2.58 | 167.5 | 1.04 | *** |
| 7 | 15 | 3.17 | 205.8 | 1.63 | *** |

LSD 5% 0.31 kg/m$^2$ LSD 1% 0.43 kg/m$^2$ LSD 0.1% 0.61 kg/m$^2$

In this case of interaction, number of plants/poot and number of poots/lm results that a large number of seeds and plants, the highest density, ensure significant positive differences on production relative with the control of experience.

*Table 8.*

**The influence of variety with number of plants/poot and number of poots/lm on production**

| Variant | | | Production | | Difference compared with the control kg/m$^2$ | Significance of difference |
|---|---|---|---|---|---|---|
| Variety | Nr.plants/ poot | Nr. poots/lm | kg/m$^2$ | % | | |
| D'Olanda | 3 | 10 | 1.20 | 100.0 | 0.00 | - |
| Volhart | 3 | 10 | 1.61 | 133.8 | 0.41 | - |
| Elan | 3 | 10 | 1.81 | 150.7 | 0.61 | - |
| D'Olanda | 3 | 15 | 1.61 | 134.1 | 0.41 | - |
| Volhart | 3 | 15 | 1.75 | 145.8 | 0.55 | - |
| Elan | 3 | 15 | 2.24 | 186.6 | 1.04 | - |
| D'Olanda | 5 | 10 | 1.56 | 130.0 | 0.36 | - |
| Volhart | 5 | 10 | 2.57 | 214.1 | 1.37 | * |
| Elan | 5 | 10 | 1.89 | 157.5 | 0.69 | - |
| D'Olanda | 5 | 15 | 1.75 | 145.8 | 0.55 | - |
| Volhart | 5 | 15 | 3.04 | 253.3 | 1.84 | ** |
| Elan | 5 | 15 | 2.95 | 245.8 | 1.75 | ** |
| D'Olanda | 7 | 10 | 2.16 | 180.0 | 0.96 | - |
| Volhart | 7 | 10 | 2.64 | 220.0 | 1.44 | * |
| Elan | 7 | 10 | 2.81 | 234.1 | 1.61 | * |
| D'Olanda | 7 | 15 | 2.37 | 197.5 | 1.17 | * |
| Volhart | 7 | 15 | 3.72 | 310.0 | 2.52 | *** |
| Elan | 7 | 15 | 3.40 | 283.3 | 2.20 | *** |

LSD 5% 1.05 kg/m$^2$ LSD 1% 1.67 kg/m$^2$ LSD 0.1% 2.06 kg/m$^2$

The obtained results show that a large number of plants/poot and a greater number of poots/lm consistently differentiate significant positiv from the control of experience.

## CONCLUSIONS

1. Cornsalad culture lends itself to high density.

2. By increasing density, provides a more efficient use of land.

3. By addition of the number of seeds/poot, from three to seven seeds/poot, provides a better production without decreasing quality of the obtained product.

4. Towars the reaction of varieties, Elan was noted the highest production, 3.40 kg/$m^2$.

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