

## FOLIAR OR CHEMICAL FERTILIZERS FOR GARDEN PEAS

Ion BOZGA<sup>1</sup>, Olimpia PANDIA<sup>1</sup>, Ion SARACIN<sup>2</sup>, Ioan Christi GANEA<sup>3</sup>

University of Agricultural Sciences and Veterinary Medicine, Bucharest, Romania, Faculty of Management, Economic Engineering in Agriculture and Rural Development, Slatina Branch, 150, Strehareti Street, Zip Code 0500, Slatina City, Olt County, Romania,  
E-mails: [veterinar\\_serv@yahoo.com](mailto:veterinar_serv@yahoo.com); [olimpia\\_pandia@yahoo.com](mailto:olimpia_pandia@yahoo.com)

<sup>2</sup>University of Craiova, Faculty of Agriculture, 19, Libertatii, Craiova City, Romania, Phone: +40251418475, E-mail: [ion\\_saracin@yahoo.com](mailto:ion_saracin@yahoo.com)

<sup>3</sup>National Institute of Agriculture Mechanization, Bucharest, Romania, E-mail: [ganea007@yahoo.com](mailto:ganea007@yahoo.com)

**Corresponding author:** [veterinar\\_serv@yahoo.com](mailto:veterinar_serv@yahoo.com)

### Abstract

*The main objective of this paper was the research and controlled study of the main physiological processes of the garden pea, the type Redondo, with the purpose of knowing adaptability the natural conditions in the area. In this purpose, was observed the special behavior of the garden pea Redondo, at the meteorological conditions that exist in this study (temperature, moist, light intensity) determining physiological that took place: photosynthesis, chlorophyll, perspiration, absorption and index of the foliar surface. During the vegetation have been realized observations regarding: moment of arising, apparition of the first real leaves, dynamics of formation leaves and their dimensions, the number of plant leaves, formation of ramification of the roots, apparition of the floral buds, opening flowers, formation of fruits and reaching full maturity.*

**Key words:** chemical fertilizers, foliar fertilizers, garden peas

### INTRODUCTION

Origin from Asia Minor and Central Asia, the pea (*Pisum sativum* L.) was cultivated in antiquity by Greek and Romans in the south of Europe, where afterwards was spread on the entire continent, and in our country was brought in the XVIIth century.

The pea is cultivated on large surfaces for its seeds rich in protein (23-28%), carbon hydrates (46-50%), lecithin, vitamins (A, B1, B2, B3, B6 și C) and mineral salts of calcium, phosphor, potassium, zinc, magnesium, iron and manganese, etc. Pea consumption protects bone system, and vitamin K from this vegetable helps blood to clot, helps to establish the level of sugar in the blood, etc. These are used as food for human and as concentrate forage for animals.

The consumption of peas gives a source of high energy for the human body, being satiable. They do not fatten and are easy to procure and cultivate in the own garden. The peas is also known as a cure for treating diseases as abdominal cramps, is efficient in

controlling anemia, fortifies the nerve cells, controls fatigue and accelerates the cell regeneration.

### MATERIALS AND METHODS

The experience was positioned at the familial holding from Olt County, Grădinari Village, in 5 variants, according to the randomized blocks, positioned in 3 repetitions:

-Factor A- Type Redondo;

-Factor B- fertilized with Amofos (Russia), N25%, P<sub>2</sub>O<sub>5</sub> 60%; fertilized with Azomures NPK 25%, 25%, 25%;

-Factor C - fertilized with Synergizer 8-32-4 (foliar fertilization); fertilized with Kalpak (foliar fertilization).

For the identification of the properties or the key attributes of the soil, sensible to exchange the function of the soil will be the investigate research of a minimum set of indicators.

Indicators selected for evaluation of soil quality must show which are the present performances of the soil and how can be preserved and improved their functions for

future usage. The selected indicators can refer to chemical characteristics or at processes that took place at the level of the soil.

The planting was realized at 12.03.2013, in a soil with pH 6, 27, after in autumn was prepared by deep tillage (20 cm) and levelled for maintenance, and during spring was minced before plantation, and the soil temperature was of 3,8<sup>0</sup>C. The plantation depth was of 8 cm, and the distance between rows is of 14 cm.

Variants:

1. Witness;
2. Variant 2. Fertilized with Amofos, N25%, P<sub>2</sub>O<sub>5</sub> 60%
3. Variant 3 fertilized with Azomures, NPK 25%, 25%, 25%.;
4. Variant 4 fertilized with Synergizer 8-32-4 (foliar fertilization);
5. Variant 5 fertilized with Kelpak (foliar fertilization).

## RESULTS AND DISCUSSIONS

After the determination of the chemical characteristics in the soil from the area of study the following information has been obtained (graphic 1).

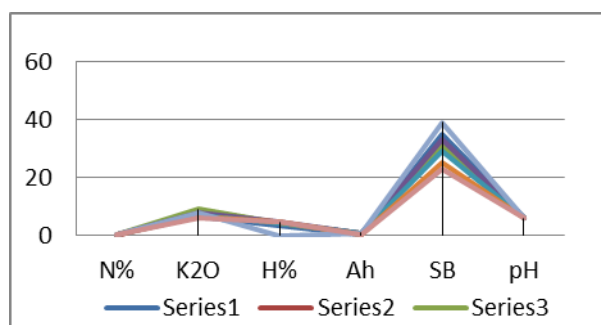


Fig. 1. Chemical characteristics of the experimented soil from the familial holding from Olt County, Grădinari Village

Source: Own determination.

The arisen took place at 27.03.2013, afterwards have been applied several protection works (weed) for extirpation of the herbs, when these were 8 cm height. The first real leaves appeared after 5 days and the administration of Amofos fertilization dressing for variant 2 and Azomures for variant 3.

During April month, took place the formation

of the stem, of the vegetative mass and of the root that starts to be pivoting, with numerous lateral ramifications on which will be found nodes. There will be realized treatments with foliar fertilizers (variant 4, fertilized with Synergizer 8-32-4 and variant 5 fertilized with Kelpak), [1].

Complex fertilizers give good results in the first vegetation phases, in comparison with the foliar ones, afterwards the application of the foliar ones begin to give better results.

Under the aspect of dynamics of increasing in height, we can observe that this assessed slowly at the beginning of the vegetation, especially at the foliar fertilized variants (16-29 April), and at 7th May, date that corresponds to a number of 38 days from planting, the plants reached a height of 42 cm, [3].

During the second intense growth that is developed during a period of 34 days, it was necessary the administration of a herbicide BASF Pulsar 40 1l / ha, being prevent the monocotyledonous and dicotyledonous.

The stems from variants 4 and 5 reached the height of 92 cm, and variant 2-3 at 82 cm. The number of interclass up to the first hull at variants 4-5 is of 9 and variants 2-3 is of 8.

The total number of interclass is at variants 4-5 of 19 and the 2-3 variants of 18.

The leaves are green and of ovoid form, the flower is white, their opening starting at the basis of the plant, the pollen was released from the opening of the flowers.



Photo 1. Pea plants reached in the period of inflorescence at all variants

Source: own results

At this type, the flowers opened between hours 10 and 18, remaining open for a period of 4 days. The blooming period is of 11 – 23

days, and the hull are a little curved, with lumpish edge of 9 and respective 10 cm, that contain 7-9 beans, that are small, round, even and of green color [2].



Photo 2. The first phenofase observations once with the administration of the fertilization dressing  
Source: own results

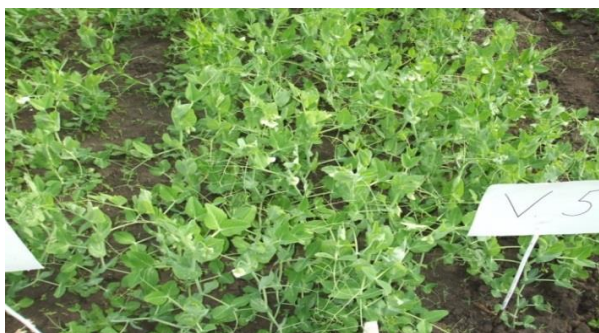


Photo 3. Variants of peas fertilized with Azomures and Amofos  
Source: own results



Photo 4. Variants of peas fertilized with Synergizer 8-32-4 and Kelpak  
Source: own results

A special particularity is that of the roots, for all variants, that developed up to a depth of 47 cm and the lateral roots exceeded 52-62 cm, being covered with nodosities. These nodosities have been spread more on the

lateral roots of first order and towards the basis of the root.

When 75% of the hulls reached full maturity (12th June), pea plants have been harvested. During this period have been obtained numerous information regarding the development of the vegetative mass during a period of 72 days for those 5 variants, this way:



Photo 5. Root when the plant was in the period of formation of blossom  
Source: own results

Table 1. The main phonologic information depending on used fertilizers

Nr. var	Seeding moment	Raisin moment	Fertilized	Moment of apparition of first leaves	First interdas	Total interdas	Date of the blossom period	Average length of the hull	Average Height of the plant
Var.1	12.03.	27.03	witness	08.04	11.04	13	19.04	4 cm	67/73 cm
Var.2	12.03.	27.03	Amofos	06.04	08.04	18	16.04	8 cm	81 cm
Var.3	12.03.	27.03	Azomures	04.04	07.04	18	15.04	8 cm	82cm
Var.4	12.03.	27.03	Synergizer 8-32-4	07.04	09.04	19	14.04	9 cm	92 cm
Var.5	12.03.	27.03	Kelpak	07.04	09.04	19	14.04	9 cm	93 cm

Source: own results



Photo 6. The chlorophyll physiological processes  
Source: own results

Firstly, as well in the second period, physiological estimations regarding the chlorophyll physiological processes were carried out, the samples being taken from the

pea leaves.

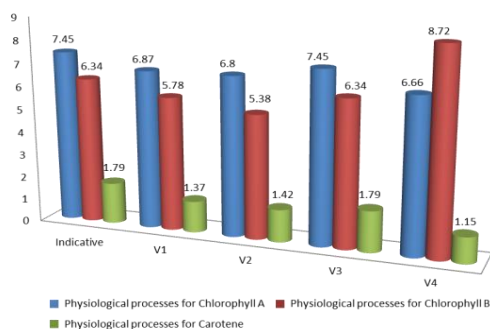


Fig. 2. Determination of physiological processes pigments chlorophyll  
 Source: own results

Therefore, the results of the studied factors led to the conclusion that also the no irrigated pea, due to optimum temperatures and rain falling in this period, had a proper development, and the physiological processes that took place in the plant had good results in the control variant, but also in the plants treated with foliar fertilizers, especially with Kelpack and Azomures N25%; P 25%; K 25%.

## CONCLUSIONS

As a result of the phenophase determination, on the experimented soil is recommended the culture of early pea, as it gives better results up to apparition of high temperatures.

Seeding in a tillage that was correctly realized during autumn and at the depth of 20 cm, will realize increment in the production in comparison with the tillage realized during spring.

There are recommended early types, especially the ones planted in the first half of March.

Early forms of peas are accordingly to the droughty regions from the south and south – west of the country, when are cultivated in not wetted system.

The usage of the foliar is mentioned only after the first floors with interclass have been formed.

The type Redondo, s-was adapted to the

existent climate and soil conditions, is indicated to be taken into consideration for early spring cultures.

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