

FOLIAR FERTILIZER APPLICATIONS GARDEN PEAS AND THEIR EFFECT ON CHLOROPHYLL PIGMENTS

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Key words: photosynthesis, chlorophyll, perspiration, protean substances, foliar fertilizers

ABSTRACT

The main objective of this paper was the research and controlled study of the main physiological processes of the garden pea, the type Getica, with the purpose of knowing adaptability the natural conditions in the area.

In this purpose, was observed the special behavior of the garden pea Getica, 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.

Many macro elements are absolutely necessary for the normal growth and development of the plants. These are N, P, K. Because these chemical substances are no longer accepted by the EU, it is pursued to gradually reduce their use by applying foliar fertilizer and biofertilizer.

INTRODUCTION

In addition to wheat and barley, it is one of the oldest crops. It was cultivated in Central Asia, and than it reached Europe, too, where it was cultivated by Greeks, Romans and Dacians. In the 13th century, together with the arrival of Saxons, and Swabians in Transylvania, peas were extended as crop.

The pea is an extremely important leguminous, that, besides the high content of protean substances is also a good ameliorative of the soil and especially as a precursor plant for the fall wheat.

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.

MATERIAL AND METHOD

Experiences with garden peas in different variants were set up that was seeded on 17.03.2012 on a soil with a 6,20 pH, using the method of randomized blocks, a Latin rectangle, set in 3 repetitions. Sowing is done in rows at 22-25 cm distance, the sowing depths is 8 cm. If we want to obtain green pods in autumn, one can sow in June. The following factors have been studied:

Factor A – foliar fertilizers Cropmax and Tecamin Max

Factor B – chemical fertilizers Azomures N15%; P15%; K15%; Amofos (Russia) N12%, P₂O₅ 52%;

Factor C – no irrigation system;

Factor D – determine chlorophyll A, B and the carotene.

The spring took place on 02.04.2012, and after this interval, 2 repetitive chemical and foliar fertilizers were applied. The first treatment took place when the plant was 6-7 cm

high, on 17.04.2012 and the second treatment was applied near the blooming period, on 09.05.2012.



Figure 1. The experimental field with the 5 variants of garden pea

RESULTS AND DISCUSSION

Growing plantlets was pursued, the increase in length of the embryonic roots and stems, respectively hypocotyls, was determined. Biometric measurements regarding the average increase of witness plantlets and their vegetative organs were considered reference values of 100%. Determining the fresh and dry weight of the vegetation biomass was done by the gravimetric method, at the precision scales. The inhibiting effects were assessed as percentage by comparison with the witness variant. The data obtained as a result of the observations and measurements from different experimental stages were statistically interpreted by analysis of the variation. The significance of the individual differences in comparison to the witness was calculated by the method of limit differences.



Figure 2. Biometric measurements and determining the vegetation biomass

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In the first, as well in the second period, physiological estimations regarding the chlorophyll physiological processes were carried out, the samples being taken from the pea leaves.

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 Cropmax and Azomures N15%; P 15%; K 15%.

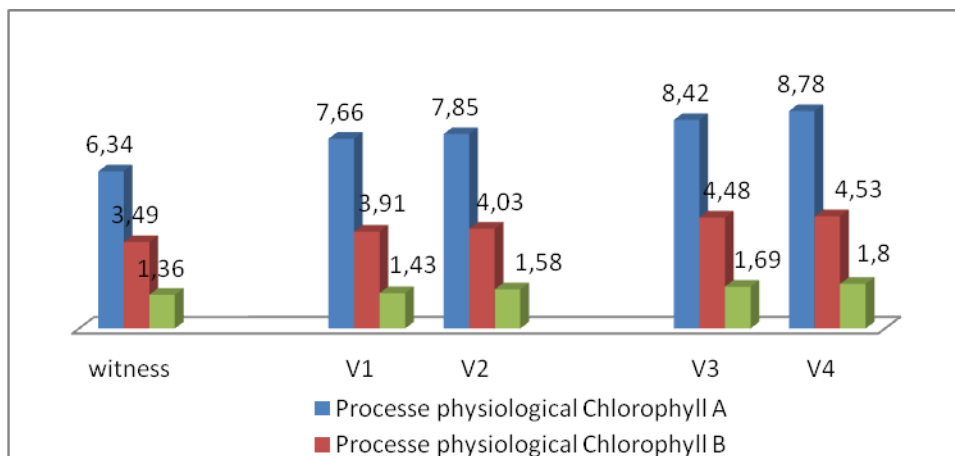


Figure.3. Chlorophyll physiological processes influenced by fertilizing 30 days after it sprang



Figure 4.Experiences regarding the analysis of the chlorophyll pigments

The chlorophyll a, has higher values in the no-irrigated crop one, the amount of chlorophyll b having values that exceeds by far the M, V1 and V2 variants. The optimum dose, from the point of view of the content of chlorophyll b is of one unit of V3 variants. The content of carotene increases in the same amount as the other assimilative pigments, having lower values in the no irrigated variants.

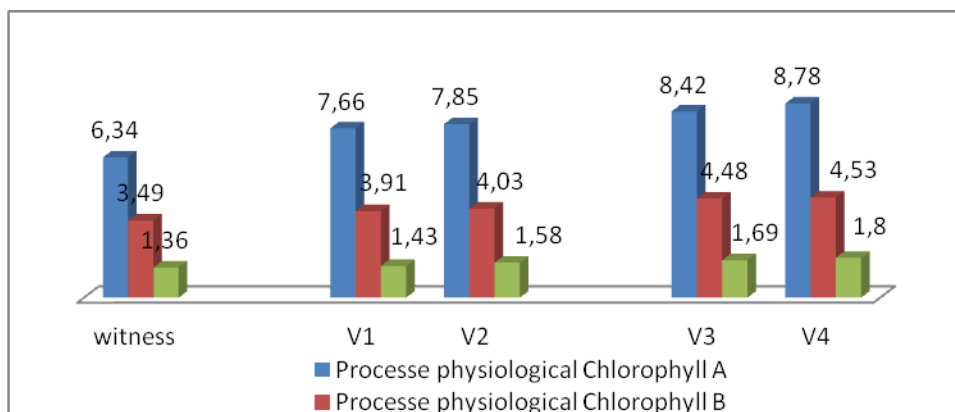


Figure.5. Chlorophyll physiological processes influenced by fertilizing 60 days after it sprang

The analysis done 60 days since it sprang pointed out the decisive role and the positive results that biofertilizers have on chlorophyll pigments, in our case variants treated with Cropmax and Tecamin Max (V3, V4) had the highest values.

CONCLUSIONS:

- Neutral, middle, warm soils with good water regime are recommended for peas.
- It is recommended a production over 3200 kg peas/ha doze de: 60-70 kg Nitrogen s.a. /ha; 60-90 kg Phosphor s.a. /ha; 70-100 kg Potassium s.a. /ha. Phosphor and potassium will be used on tilled soil or when the soil is prepared.
- Nitrogen fertilizers are used on stages because 40-70 % of the needed nitrogen is provided by the pea through the symbiotic process (bacteria fixing bacteria).
- Biofertilizers used gave good results with respect to the physiological processes that took place at the level of the plant especially chlorophyll pigments studied as well as the production.

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