STIMUSOIL 200 PRODUCT APPLICATION EFFECT ON GROWTH AND FRUITING OF BLUERAY BLUEBERRY CV.

EFECTUL APLICĂRII PRODUSULUI STIMUSOIL 200 ASUPRA CREŞTERII ŞI FRUCTIFICĂRII SOIULUI DE AFIN BLUERAY

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Abstract. *Studies regarding the effect of Stimusoil 200 dual-action product application (biostimulator and fertilizer) at RIFG Pitesti, during 2005-2006 periods, were performed. The experiment was organized in a 20 years old plantation, with 4,000 plants ha^{-1}, according to the following scheme: T1) ground application with incorporation; T2) ground application without incorporation; T3) control, water application. Each trial was linearly designed in 3 replications (10 bushes per replication). The product was applied in June 2005, at a dose 0.1 ml m^{-2}. Measurements were carried out on vegetative growth yield and fruit quality. The results showed the positive effect of Stimusoil 200 ground incorporation on vegetative growth and yield of bushes, which increased with 52% and 62% respectively, compared with control. In both treated plots, the fruit quality was improved.*

Key words: yield, fruit weight, chemical composition

Rezumat. *Studii cu privire la efectul aplicării produsului cu acţiune dublă (biostimulator şi fertilizant) Stimusoil 200 s-au efectuat la ICDP Pitesti-Mărăcineni în perioada 2005-2006. Experienţa s-a organizat într-o plantaţie în vârstă de 20 de ani cu 4000 de plante /ha, după următoarea schemă: V1 aplicare la sol cu încorporare, V2 aplicare la sol fără încorporare, V3 martor tratat cu apă. Fiecare variantă a fost dispusă liniar în 3 repetiţii cu 10 tufe/repetiţie. Produsul s-a aplicat în luna iunie 2005, în doză de 0,1ml/m^2. S-au efectuat determinări privind creşterile vegetative, producţia şi calitatea fructelor. Rezultatele obţinute au evidenţiat efectul pozitiv al produsului asupra creşterilor vegetative, care au fost cu 52% mai mari şi a producţiei de fructe care a crescut cu 62 % în varianta cu încorporarea în sol faţă de martor. În ambele variante tratate calitatea fructelor a fost îmbunătăţită.*

Cuvinte cheie: producţie, greutate medie, compoziţie chimică

INTRODUCTION

High blueberry bush is native from North America and in Europe started into culture at 1925 and in 1968 was introduced in Romania too. The first blueberry cultures have been done at Research Institute Pitesti Maracineni and at research stations Baia-Mare, Iasi and Fagaras. One aspect of technology, the fertilization as important factor with major effects in terms of fruit production, has been widely studied abroad (Ciovatta and Benedetti, 2000, Clarkson and Lüttge, U.

1990, Mengel, 2002, Andrew in 2002), at home at Pitesti Maracineni and in the fruit growing research network (Mladin, et al., 2008, Borlan, 1988; Chitu E., 2000, Platon, 2006, Cardei E. 2006, Iancu et al., 2008, Chitu V., et al., 2008). This paper is part of that research, and is goal is to obtain a balance between growth and fructification by additional nutrition and to stimulate the yield production by product application.

MATERIAL AND METHOD

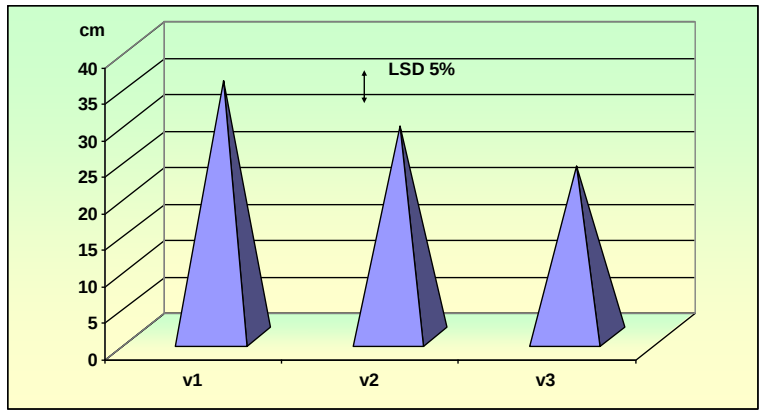
Studies regarding the effect of product with double action application (bio-stimulator and fertilizer) Stimusoil 200 was made at Research Institute for Fruit Growing Pitesti - Maracineni in 2005-2006 periods. The experimental field was placed in a 20 years old plantation with 4,000 plants ha^{-1}. The following trial scheme was done:T1 – application of the Stimusoil 200 product in June 2005, at a dose of 0.1 ml m^2, with soil incorporation, T2-Stimusoil ground application without soil incorporation, T3 - control treated with water. The soil from experimental plots was pseudogleic vertic type, medium-textured up to 60 cm deep and compact clay deeper than 60 cm. Soil has a moderate acidity, medium supplied with nutrients and a low concentration in humus. Each trials plot has been ordered linearly in 3 replications, with 10 bushes per each replication. Observations and tests were carried out related to vegetative growth, production, fruit quality and flower bud induction for the next year (biometric method were used). To evaluate the vegetative growth, shoots from all bushes were measured. Fruit production was determined in each replication and trial. To determine the fruit weight, 100 fruits were collected from each replication and trial. Fruit dry matter and pH were determined in the laboratory on 50 fruits from each replication and trial. The number of inflorescences was determined on the control branches and was reported at a length of 20 cm of 2 years stems. The data were processed by analysis of variance.

RESULTS AND DISCUSSIONS

Foliar application of nutrients to the soil or plant is based on the ability of the plant to absorb nutrients and transport them to their points of growth. Stimusoil 200 is a liquid organic fertilizer with a joint action – fertilizer and biostimulator, to meet the requirements of sustainable agriculture. Results obtained following the application of this product are shown in Figures 1-6. Growth is a quantitative accumulation process leading to increase the vegetative plant biomass. The longest blueberry shoots are generated from the buds located at the upper third part of the bushes stems and usually have had 2 waves of growth. The first wave duration was of 30 days from the end of flowering period, and the second was of 30 days before harvesting. Stimusoil 200 applications had a favorable effect in increasing the shoot length, the differences being statistically assured. The largest growth of the shoots were recorded in the trial in which the product was incorporated into the soil (T1 - 52% longer than control, differences being very significant), and a growth with only significant differences compared with the T2 trial (without product incorporation, figure 1). The best results obtained in the plot when the product was incorporated into the soil, could be

attributed to the fact that once placed in the root zone, the product was immediately absorbed from the root surface.

Also, from figure 1 one can see that differences statistically assured were obtained between the trial without product incorporation (T2) and control, the shoots lengths being increased with 24**%.**



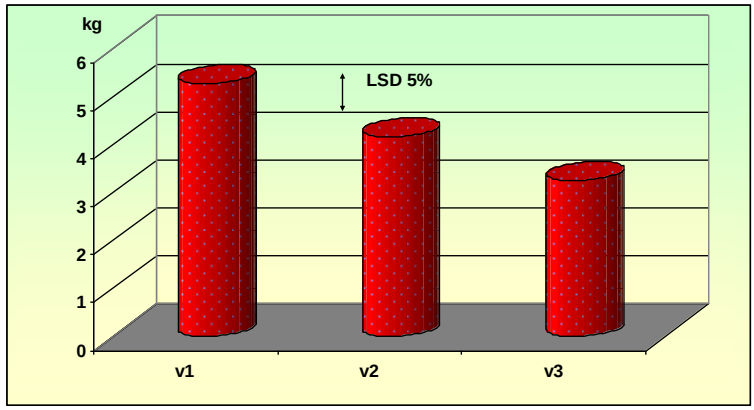
DL 5%= 2.765

Fig.1. The effect of Stimusoil 200 application on the shoots length

Regarding the fruit production obtained in the experimental plots, one can see from figure 2 that the best results were obtained in the trials in which the product was incorporated into the soil (T1), the fruit production per bushes being very significantly higher with 62% compared to control (T3) and significantly bigger with 27% compared to the plot without product incorporation (T2). Significant differences were also obtained between the plot without product incorporation into the soil and control, fruit production in this case being with 28% higher (figure 2).

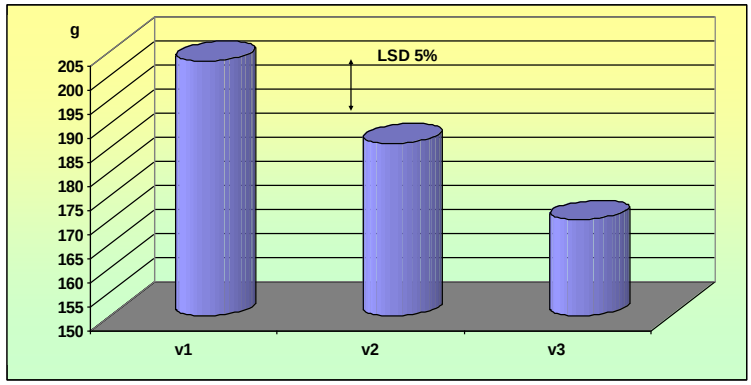
Analyzing the effect of Stimusoil 200 application on the average weight of 100 fruits, one can see from Figure. 3 that the 100 fruits average weight was positively influenced in both treated plots, compared with control. However, in the plot with product incorporation into the soil were recorded the best results, very significantly higher (19% vs. control), and significantly distinct compared with plot without product incorporation into the soil where the weight of 100 fruit was 9% lower (figure 3).

Positive effects on fruit dry matter were recorded in the treated plots, too. One can see in figure 4 that the percentage of fruit dry matter increases very significantly by 29.5% in plot with product incorporation into the soil and by 22.2% in the plot without product incorporation, compared with fruits from untreated plot. There were not statistically assured differences between the treated plots fruits dry matter.



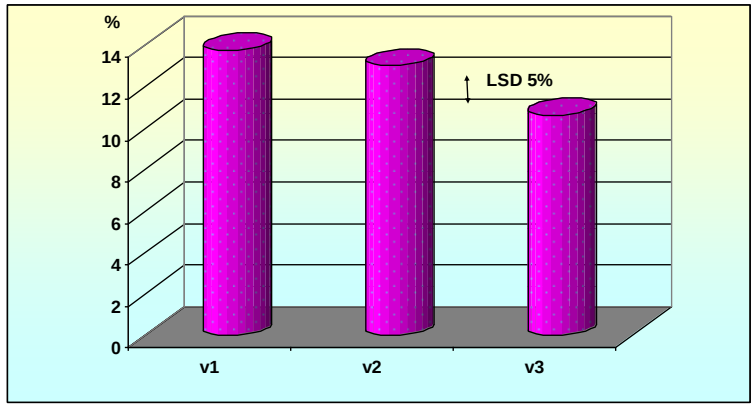
DL 5%= 0.745

Fig.2. Effect of Stimusoil 200 application on fruit production (kg / bush)



DL 5%= 10.690

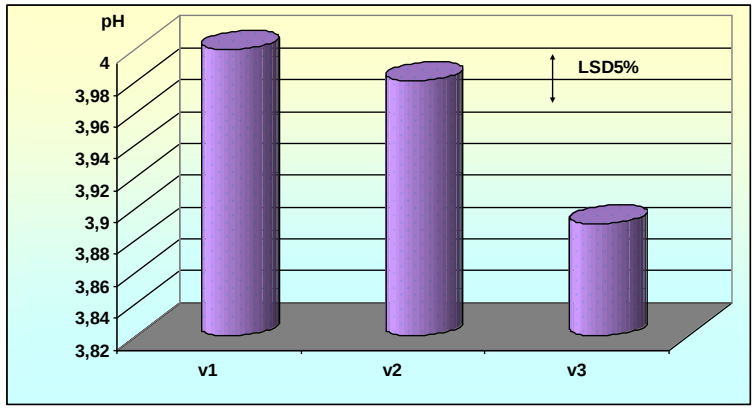
Fig.3. Effect of Stimusoil 200 application on average of 100 fruits weighs (g)



DL 5%= 1.810

Fig. 4. Effect of Stimusoil 200 application on fruits dry matter

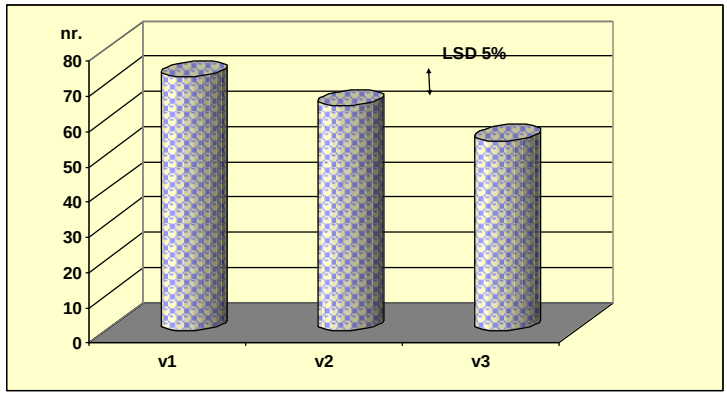
One recorded statistically assured in fruit pH (determined in fresh juice fruit) between treated plots and control and without statistically differences between the two methods of application (figure 5).



DL 5%=0.32

Fig. 5. Effect of Stimusoil 200 application on fruits pH

Analyzing the effect of Stimusoil 200 application on flower buds, one can see in figure 6, that the product have had a positive influence. The number of inflorescences per bush in treated plots were with 33% (T1) and 19% (T2) higher than control. Regarding this indicator statistical differences were obtained between the treated plots. However, in the plots in which the product was incorporated into the soil, the number of inflorescences was 13% higher compared with the plot without product incorporation into the soil.



DL 5%= 2.829

Fig 6. Effect of applying Stimusoil 200 of the number of inflorescences

CONCLUSIONS

By applying the liquid organic fertilizer Stimusoil 200 in dose of 1l ha^{-1} were obtained the following results:

1. The length of shoots was with 52% higher in the plot with product incorporation into the soil (T1), compared with control (T3);

2. The fruit production increased by 62% in the plot with product incorporated into the soil (T1), versus control. Stimusoil 200 application, induced an higher average fruit weight and also a higher fruit dry matter content and a higher fruit juice pH compared with control.

3. Number of inflorescences per two years old stems was with 33% higher in the plots with product incorporated into the soil, compared with control and with 13% higher versus the plot without product incorporation.

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