



Agricultural High School

Olomouc, U Hradiska 4, 779 00 Olomouc, Czech Republic

Phone: +420-585205660, e-mail: szes@szes-olomouc.cz

Testing the effect of biological additives PGE Flora Forte on the production of flowers of greenhouse roses

The test was carried out in the Research institute of landscaping and ornamental gardening in Pruhonice Czech Republic and was focused on testing the effect of PGE biological additive FloraForte. The aim was to verify its effects on the production of flowers and greenhouse roses, which took place in the framework of the project supporting the growth of plants in the gardening without the use of chemical products (enhancers) which can leave harmful residues in plants and the soil.

Two species of Dutch roses were selected for testing, **Anout** and **Dynamite**. To obtain objective and statistically significant results a block method was used which involved several plots of land for the test. Each species was planted to separate the flower bed and on each garden bed (variety) three experimental plots were set up which were all about the same size of 10 m², wide 1 m and long 10 m, marked **V1** = plot control (treated PGE Flora Forte), **V2** = the plot treated with only 1xapplication, **V3** = plot treated with 2xapplications. Roses were planted into sandy aluminium soil with a porous bottom layer and the content of humus 5 - 7%, with a coefficient of pH 6 – 7.

The total mass of species **Anout** with one treatment has reached 6900 grams and the double treatment has yielded a final weight of 8140 grams. For the species **Dynamite** the weight gain curve of the harvested plant approximated to a linear relationship between applications and total weight of the harvest. After the first application of the bio-additive PGE Flora Forte, the total weight was 3165 grams, after the second application the weight was 3440 grams and after the third application the total weight reached 3515 grams.

The test results have shown that the performance of PGE Flora Forte was very effective on both varieties of Dutch roses, especially in terms of increasing the weight of the plants. Although increasing the number of harvested flowers was not the objective of the tests, yet there was a positive effect of PGE FloraForte for both varieties of roses. In any case, it is a biological ingredient that is harmless to the environment and in horticultural production can replace or reduce the use of inorganic fertilizers and pesticides.

The crop as tested used a process of fertilization form by dropping liquid fertilizer in ten-day intervals. In the course of the vegetation insecticidal protection against onion thrips, obdulia hops, aphids and also fungicidal protection against the occurrence of the so-called "fallen" was implemented.

The result of the test significantly proved the positive impact and the effect of PGE Flora Forte in increasing the weight and number of the greenhouse roses. The test has also shown that PGE Flora Forte when being applied twice in the course of vegetation of greenhouse roses further increases the weight and the number of roses thus offering additional improvements in productivity. The results of the test can be applied to roses of different varieties and species currently grown in the rose garden, nurseries, private and botanical gardens.

PGE FloraForte was applied in the form of spraying on the ground in a dose of 3ml.10 m⁻² which corresponds to the dose 3 l per 1 ha. For the spraying of each plot PGE Flora Forte was mixed in 3 litres dosages of water. The results of the testing indicating the weight and number of stalks with the flowers of the varieties Anout and Dynamite are presented in the table no 1:

Table no 1

Variety - Anout		
Summary the results of the		
Variant	Weight [g]	The number of [KS]
1	6900	351
2	5745	289
3	8140	403

Variety - Dynamite		
Summary the results of the		
Variant	Weight [g]	The number of [KS]
1	3165	224
2	3440	240
3	3515	245

Legend to table no. 1:

Option 1 – the control, treated

Option 2 – 1x treated PGE Flora Forte

Option 3 – 2x treated PGE Flora Forte

Table no. 2 Statistical evaluation of the test, including the required data for its further evaluation

The statistical characteristics of the		
The statistical characteristics of the	The average weight of the one plant the variety " Anout "	The average weight of the one plant the variety " Dynamite"
Statistical characteristics of the test 1		
The arithmetic average – weighted form	18,44	13,58
Average absolute deviation – weighted form	2,01	3,47
Variance – weighted form of	6,12	16,98
The standard deviation of	2,47	4,12
Variation range	8,00	12,05
The coefficient of variation	0,13	0,30
Statistical characteristics of the test 2		
The arithmetic average – weighted form	18,27	12,69
Average absolute deviation – weighted form	3,35	2,81
Variance – weighted form of	17,19	11,64
The standard deviation of	4,15	3,41
Variation range	13,30	11,32
The coefficient of variation	0,23	0,27
Statistical characteristics of the test 3		
The arithmetic average – weighted form	18,09	14,15
Average absolute deviation – weighted form	2,98	5,38
Variance – weighted form of	13,76	41,86
The standard deviation of	3,71	6,47
Variation range	11,80	18,78
The coefficient of variation	0,20	0,46

From the above tables we can make the following conclusions:

1. The total weight of the first variants of the varieties **Anout** was **6900 grams**. For the other variants of the same variety a small decline was recorded due to damage caused to the root system by a mole, which lead to worsened transport of nutrients to the plant. The total weight was therefore **5745 grams**. Visibly increased yield has been achieved for the third variant which has been treated with PGE Flora Forte resulting in mass of **8140 grams**.

2. For varieties of **Dynamite** the total weight of the harvested plants increased gradually with the number of applications of PGE FloraForte. For variant 1, the total weight of **3165 grams**, the total weight of variant 2 was 3440 grams and for variant 3, the total weight **3515 grams**.

The table no 2 shows the values of variation margin which could be affected by external influences:

a) The Variation range in the variety Anout – test 2

The observed value of 13,30 testifies the fact that within the set of roses there was an occurrence of a variation in weight. We believe that this factor was influenced by the presence of rodents, which could damage the root system of the roses.

(b) The Variation range in the variety Dynamite – test 3

The observed value 18,78 testifies the fact that within the set of roses there was an occurrence of a variation in weight. We believe that this factor could be influenced by the effect of the reference product PGE FloraForte for this variety.

The test was implemented in the Research institute of landscaping and ornamental gardening Pruhonice

Prof. A. Novak – senior supervisor of the test