FERTILIZING PROCEDURES OF THEA ROSES GROWN IN GREENHOUSES ON EARTHY BROWN COAL AND SOIL

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Astract

Roses growing inside greenhouses is usually performed in soils fertilized with organic and chemical fertilizers.

Having in view that, on such a soil, the nutrition demand control is extremely difficult to be achieved, the experiences which we have performed were placed on soil and on earthy brown coal, the thickness of which equaled 45 cm.

The objective of these researches was mainly to check a series of fertilizing procedures, supposed and designed to allow the maintaining of an optimal mineral nutrition level, also to obtain satisfying production performances and superior economic efficiency of the current method of rose growing in the soil.

Key words: roses, greenhouse, fertilizing procedures

INTRODUCTION

Their graciousness and their highly productive potential place the rose among the most appreciated flowers, cut within our protected areas.

The latest opinion survey, performed and achieved among the flower buyers and flower producers /florists in Europe, make the rose come on the second place, after carnations.

MATERIALS AND METHOD

The experienced variety was the Red Success culture. There have been performed 6 alternatives in 4 repetitions, each repetion counted 128 plants, having a density of 8 plants a m² (table no. 1).

The basic soil fertilization for versions V and VI has been achieved by using 200 t /ha earthy brown coal, 100 t /ha animal compost, 200 kg ammonium nitrate, 400 kg potassium sulphates and 600 kg superphosphate.

The earthy brown coil placed in a 45 cm thick bed has been fertilized and neutralized with the following doses/quantities, calculated for a m³: chalk 4.5 kg, simple superphosphate 3.5 kg, ammonium nitrate 1 kg, manganese sulphates 1.6 kg, potassium sulphates 1.6 kg, borate de soda 16 gr., ammonium molybdenum 5 grams.

The basic fertilizers have been pulverulently mixed with the sublayer (the earthy brown coal), while those with micro-elements have been dissolved in water, being afterwards uniformly administered.
For versions III and IV, the basic /background fertilization has been performed by using only a half of the dose /quantity used for versions I and II.

Table 1

Experimental Versions within the Rose Fertilizing Method

Version	Culture Sublayer	Fertilizing method
I II	a_1 – in earthy brown coal fertilized with full doze a_1 - in earthy brown coal fertilized with full doze	b1 – when N and K diminish to critical levels b_2 – complete fertilization by maintaining the macro-elements at optimal levels
III IV	a_2 – in earthy brown coal fertilized with 1/2 doze a_2 - in earthy brown coal fertilized with 1/2 doze	b1 – when N and K diminish to critical levels b_2 – complete fertilization by maintaining the macro-elements at optimal levels
V	a_3 – in soil a_3 – in soil	b1 – when N and K diminish to critical levels b_2 – complete fertilization by maintaining the macro-elements at optimal levels

The plant caring works applied have been the same with the specific plant caring works. The Sublayer analyses have been performed twice a month. The phasic fertilizations have been performed only on the basis of the laboratory analyses. During the first phase, the night-day temperature values were of 15° C, while the average humidity equaled 70 – 80%. After 3 weeks from planting the roses, the temperature during the night was maintained to 17° C, whereas during the day it varied between 19° C and 35° C.

The laboratory results of the first basic/ background fertilization analyses pointed to a content extremely high in mineral substances, soluble in water (1:5), for the earthy black coal fertilized with a full dose (66 – 71 mg N, 23 – 29 mg P_2O_5, 85 – 88 mg K_2O, 62 – 80 mg CaO, 15 – 18 mg MgO, to 100 gr. dry soil and 0.91 – 0.96% mineral residue), a more diminished /reduced content in the earthy black coal layer fertilized with ½ of the dose (39 – 40 mg. N, 16 – 17 mg. P_2O_5, 46 – 50 mg. K_2O , 39 – 40 mg. CaO, 11 – 12 mg. MgO to 100 gr. Dry soil and 0.40 – 0.41 % mineral residue).

The initial content of mineral substances into the soil (versions IV and V) are situated close to the established optimal levels.

The minimal and optimal values established by the research diagram were as follows:

Versions II, IV and VI: 22 mg. N, 30 -35 mg. K_2O to 100 gr. dry soil.

Versions I, III and V: 12 mg. N, 12 mg. K_2O to 100 gr. dry soil.

It has been therefore ascertained that, by growing these plants according to a correct watering strategy, meant to reduce the losses by elutriation, the content of the main mineral elements has decreased, thus registering different data for the established levels: july, the 20th, for version II, June, the 18th, for version III, March, the 24th, for version IV, March, the 8th, for version V, the 4th of December for version VI.

It has been further on demonstrated that, for the fertilization process during the rose vegetation stage, it will not be sufficient only to supplement the potassium and the nitrate, as some of the authors suggest and propose (M. Lasala, Cardus 2000), because the calcium and the phosphor diminish themselves to critical levels (6 mg. P_2O_5 , 25 mg. CaO).

Summing up the fertilizers quantities supplementary applied, we will reach the following values: 12 gr. s.a. /m² for version I, 76.5 gr. s.a. /m² for version II, 29.5 gr. s.a. /m² for version III, 123 gr. s.a. /m² for version IV, 150.5 gr. s.a. /m² for version V, 172.5 gr. s.a. /m² for version VI.

RESULTS

As far as the flower crop dynamics is concerned, the best results have been obtained for version II, namely the flower culture in earthy black coal sublayer, fertilized with a full dose for the basic fertilization and with complete fertilization during the vegetation stage, by maintaining the macro-elements at optimal levels, followed by versions IV, I, VI, III and V.

This situation was due to a more balanced provision of mineral substances, all along the whole vegetation stage and also to a higher temperature at the level of the radicular system in the earthy black coal than in normal soil. As for the whole production, it was larger at version II – culture on earthy black coal sublayer fertilized with a full dose for the basic fertilization process and with complete fertilization during the vegetation stage, maintaining the macro elements at optimal levels. For this version, the production has reached a quantity of 52.65 flowers / m² followed by version IV – culture in earthy black coal sublayer fertilized with ½ of the dose for the basic fertilization process but with complete fertilization, during the vegetation stage, maintaining the macro elements at optimal levels, for which a total of 49.8652.65 flowers / m² were obtained.

The soil culture had lower results, namely 44.61 flowers /m², version IV, with complete fertilization during the vegetation stage /period and of 40.51 flowers / m² for version V, for which the fertilizations during the vegetation period have been performed only when N and K diminished to critical levels. As far as the flower production quality is concerned, it has been ascertained that the extra quality flower percentage has registered

values ranging between 75.3 – 86.2, the highest extra flowers percentage being registered for version II, while the lowest was registered for version V.

The highest profit was registered for version II – flower culture in earthy black coal sublayer, fertilized at its basis with a full dose and during the vegetation period with complete fertilization, maintaining the macro elements at optimal levels, of 1110 million lei /ha, while the lowest was registered for version V – soil culture fertilized during the vegetation period only when N and K have reached the critical levels of 111 million lei /ha.

CONCLUSIONS

- The flower culture on earthy black coal sublayer, fertilized with a full dose of fertilizers, then, during the vegetation stage, with the macro elements maintained at an optimal level, although requiring 524 million lei higher costs /ha, as compared to the similar version cultivated in average soil, reaches profits of 864 million lei more /ha than the flower culture in average, regular soil.
- The flower on earthy black coal sublayer, fertilized with half – ½ a dose of fertilizers, registering a reduced production, meet less favorable economic indicators.
- The additional fertilization performed when N and K diminish to critical levels reduces, in all the situations, the values of the economic indicators, as compared to applying the fertilizers in order to maintain an optimal level.

REFERENCES

1. Cayrol, J.C., 1986 La rose et l'energie, P.H.M. – Revuie Horticole, no.263.1.
2. Bensa, Stefano, 1996 – Floricultura industriale – Agricole Publishing house, Italy.
3. Selaru, E., 1995 – Greenhouse crops for ripper flowers – Ceres Publishing house, Bucharest.
4. Vlad, M., 2001 – Arboriculture – Imprimeria de Vest Publishing house, Oradea.