

YIELD AND QUALITY OF GRAPES OF CHARDONE SORT WITH THE USE OF THE ORGANICALLY-MINERAL FERTILIZER GUMISTAT

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It is set that triple vineyards sprinkling of the white technical sort of Chardone by organically-mineral fertilizer GumiStat TM "GumiSil" increases the growth of the biological mass of the above-grounded part of the grapes bush. Grapes yield increases on 12,5% - 27,9%, thus sugar enrichment in grapes berries increases accordingly.

Keywords: grapes, Chardone, organically-mineral fertilizers, GumiStat, yield, sugar enrichment.

Introduction: In the last decennary in Germany, as well as in some other countries of Western Europe, stable and qualified yield on the fields were reached only by substantial usage of the large not always reasonable volumes of mineral fertilizers and chemical methods of plants defense. However, from the other side it became one of the main reasons of significant falling of biological indices of the fields soil denutrition. Nowadays it was noticed the necessity of the agrarians of serious economically and ecologically based conceptions of growing agricultural products [5].

Soil enrichment by nutritives is not always and equally marked in regards of all nutritives necessary for the plants. The plants absorb the elements of mineral feeding in quantity relation which reflects their biological requirements. However, disturbance of the physiological state of the plants due to stress (temperature and chemicals) even with the usage of the physically balanced substances can provoke a lack or an excess of mineral feed elements. The features of the grapes culture have an effect on the usage of the biologically active preparation. Grapes feels the necessity of the feeding before blossom, during ovary and before the berries get ripened. It's very important to feed before blossom while the bush consumes lots of the feeding substances for making trusses.

The target of this study was to determine the influence on the yield and quality of grapes of Chardone sort with the optimal concentration of the organically-mineral fertilizers.

Subject, materials, methodology and research methods: Researches were done in the AF "Shabo", Belgorod-Dnestrovskiy district, Odessa region, 2017. **Research subject:** concentrations of organically-mineral fertilizer "GumiStat". **Materials:** white technical sort of grapes Chardone.

Plantation of grapes sort of Chardone, planted in 2008, engrafted in 10114. The scheme of the plantation - 2.6 x 1m. Bushes are formed by single side horizontal cordon. Bushes weight with fruit-bearing elements is done by short cutting around the 4-5 knot by 2-3 eyes.

Research methodology: On field researches were filled up randomly by triple repeating. The quality of bushes by each variation is 15.

The scheme of the research: variation 1 - control (water consumption), variation 2 - nonroots feeding by GumiStat fertilizer with concentration 0,004% and variation 3 - nonroots feeding by GumiStat fertilizer with concentration 0,006%.

The bushes were treated with water based solution of organically- mineral fertilizer of TM "GumiSil" GumiStat in calculation 40ml or 60ml per 10l of water in terms: 2-3 days before blossom begins - 1st term (01.07.17), in phase of berries growing - 2nd- (20.07.17) and in the beginning of berries ripening - 3rd (29.08.17).

"GumiStat" is an integrated ecologically friendly organically, mineral fertilizer based on potassium made from the natural raw (lowland turf). The main acting substances of GumiStat are humic acids, fungous bacterium Trychoderma, N-P-K and micro-elements. It includes amino acids (treonin, methionin, lizin, cycthin and others); vitamins - B1, B2, B3, B6, B12, C, D,

E, PP, provitamin A - carathin, folic acid and others; enzymes which catalyze oxidative reactions (catholize and peroxidize) and reactions of hydralization (amylize and ureaze), proteins, poly- and monosaccharins, pectins, melonoids and phytohormons.

Due to usage of GumiStat assimilation of the main fertilizers is noticeably improved, resistance to the dry and cold weather, infections and stresses are increased (immunity of the plants), there is no stress due to different methods of plants defense, soil structure is improved and becomes resistant to the soil corrosion, ecological cleaning takes place and the quantity of organic substances and humus are increased accordingly.

During vegetative period on the researched plots they do phenological observation and fix the beginning of the blooming phase, ripening and technical ripeness. Phytometrical measument is done after finishing vegetative growing of the bushes, such as determination of the leaf surface, annual increase in lineal and volumetric measument. The terms of harvesting are done according to dynamic indices of mass sugar concentration, titratable acids, Ph, sensor characteristics of grapes. During harvesting it is counted the amount and the average weight of the grapes bunch.

Results of the research: Suitability of the usage either this or that acceptance of biological features of each breed is determined by power of bushes growth or development of the monocyclic increase and then the leaf surface, size and productivity of which in the end is determined the possibility of the receiving high and conditioned harvest in a current period and creating appropriate conditions for normal growth and grapes fruit-bearing for the next vegetation.

Usage of the fertilizer GumiStat leads to increase of the vegetative mass of the bush. It was expected to have an increased diameter of the leaf, quantity of the leaves, length and diameter of the shoots. In the researched samples the quantity of the leaves was increased, in average up to 32,4 - 37,1 leaves per shoot versus to 27,2 pcs. in comparison with the control variation, on some shoots it was up to 60 leaves and more pre shoot, it was done due to stepchildren which had to be removed.

Leaf diameter in researched samples was 16,8cm and 17,2cm versus 15,5cm on the control ones.

The biggest square of the leaf surface of the bush supposed to be in the variation where they used fertilizer GumiStat in rate of 60ml/10l, it increased on 4,46m² or 52,9%. With the usage of nonroot feeding with GumiStat in rate of 40ml/10l the square of the leaf surface increased on 3,89m² or 46,2% comparing with the control sample, review the chart.

Table 1. Influence of organically-mineral fertilizer GumiStat on development and growing of grapes bush of sort Chardone, 2017

Variation	Quantity of the shoots per bush, pcs	Square of one leaf, cm ²	Square of leaf surface		Shoot average length, cm	Volume of solid increase	
			bush, m ²	hectare, thousand m ²		bush, cm ³	hectare, m ³
Control (water)	16,5	188,6	8,46	32,5	147,6	1689,2	6,50
40 ml/10 l	17,2	221,5	12,35	47,5	162,7	2196,7	8,45
60 ml/10 l	15,0	232,2	12,92	49,7	177,4	2302,9	8,86
HCP ₀₅					11,6		

The average length of the shoot with the use of fertilizer GumiStat with the rate 40ml/10l was increased on 15,1cm than the control variation and with rate of 60ml/10l on 29,8cm accordingly. The difference between variations of the research was done mathematically $HCP_{05}=11,6$ cm (table 1).

The average diameter of the shoot in researched variations with the use of the fertilizer GumiStat with the rate 40ml/10l and 60ml/10l was 10,0mm and 10,5mm against 9,4mm on the control sample.

The biggest volume of the monocyclic bush increase was reached in variation where they used fertilizer GumiStat with the rate of 60ml/10l, it was increased on 613,7cm³ or 36,3% more than on the control one. With the usage of nonroot feeding of grapes with fertilizer GumiStat with rate 40ml/10l the volume of the monocyclic bush increase was on 507,5cm³ higher than the control sample (table 1).

In literal resources we found data about increase of the harvest with the use of regular regulator of growth up to 30% [1,2,3,4].

Our researches proved that during the first year the increase of the harvest is done due to growth of the grapes bunch weight. The made up records of the bush harvest in variation showed the quantity of the grapes bunches changes slightly however, bunches weight was increased significantly under the treatment of GumiStat. With the usage of GumiStat with the rates 40ml/10l and 60ml/10l the weight of grapes bunches increased on 38,4g and 44,8g accordingly in comparison with the control variation. The difference between variations of the research was calculated mathematically $HCP_{05}=24,6$ g (table 2, draw.1).



Drawing 1 Grapes bunches of Chardone under influence of fertilizer GuliStat with different concentrations, 2017.

Table 2. Influence of organically-mineral fertilizer GumiStat on yield and quality of grapes, sort Chardone, 2017

Variation	Quantity of bunches per bush, pcs	Weight of bunch, g	Yield of bush, kg	Yield		Sugar content g/dm ³
				t/ha	%	
Control (water)	13,7	198,3	2,71	10,4	100,0	167
40 ml/10 l	12,9	236,7	3,05	11,7	112,5	172
60 ml/10 l	14,2	243,1	3,45	13,3	137,9	180
HCP_{05}		24,6				8,3

The highest yield from the bush held in variation where they used fertilizer GumiStat with the rate 60ml/10l and it was increased on 0,74kg/bush comparing with the control one, in recalculation the yield on one hectare of grapes planting in this variation was increased on 2,9t/ha or 27,9% comparing with the control one. With the use of fertilizer GumiStat with the rate of 40ml/10l the yield from a bush was held in the amount of 3,05

kg/bush which is 0,34 kg/bush more than in the control one. In recalculation the yield on one hectare of grapes planting in this variation was increased on 1,3 t/ha or on 12,5% more comparing with the control variation (table 2).

The highest mass sugar content was noticed with the use of GumiStat fertilizer with rate of 60ml/10l, it was 180g/dm³ which is on 13g/dm³ more than in the control variation. The difference between variations of the research was done mathematically HCP05= 8,3g/dm³ (table 1). With the use of GumiStat fertilizer with the rate of 40ml/10l mass sugar content in the berries juice became on 5g/dm³ higher than in the control variation. The difference between variations of the research was done mathematically HCP05= 8,3g/dm³ (table 1).

Conclusions: The researches showed up the positive influence of the use of nonroot feeding with organically-mineral fertilizer GumiStat of TM "GumiSil" for enlargement of grapes yield of Chardone. Concentration of the fertilizer in the rate 0,006% is the most productive and effective. It is necessary to continue the researches and it is planned to get the results of the influence of nonroot feeding with organically-mineral fertilizer GumiStat on the quality of white table wines in Odessa region.

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Аннотация

Тараненко О.Г. Урожай і якість винограду сорту Шардоне при застосування органо-мінерального мікродобрива ГуміСтат.

Встановлено, що 3-х кратне обприскування виноградників білого технічного сорту Шардоне органо-мінеральним мікродобривом ГуміСтат ТМ «GumiSiL» збільшує приріст біологічної маси надземної частини виноградного куща. Урожайність винограду підвищується на 12,5 - 27,9%, при цьому збільшується накопичення цукру в соці ягід.

Ключевые слова: виноград, Шардоне, органо-мінеральне мікродобриво, ГуміСтат, урожай, цукристість.

Annotation

Taranenko O.G. Yield and quality of grapes of Chardone sort under treatment of organically-mineral fertilizer GumiStat.

It is set that triple vineyards sprinkling of the white technical sort of Chardone by organically-mineral fertilizer GumiStat TM "GumiSiL" increases the growth of the biological mass of above-grounded part of the grapes bush. Grapes yield increases on 12,5% - 27,9%, thus sugar enrichment in grapes berries increases accordingly.

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