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The usage of fertilizers in the vineyard

It is well known that the quality of wine in many ways depends on the health of the vine and the nutrition of soil in which it grows. With the aim of improving the quality values of these two components different fertilizers are used, i.e. special substances for increasing the soil capabilities and nutrition of plants.

Even if conditions in the vineyard were ideal originally the vine during the process of its vital activity annually extracts a large number of nutrients from the soil and over time the soil becomes depleted. For this reason it is

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necessary to introduce fertilizers in time and accurately adjust their appliance with regard to essential nutrients.

An adequate use of fertilizers is based on the findings of studies of soil and vine itself. It allows to improve significantly the quality and quantity of “sunberry” harvest as well as to enhance the resistance of plant to unfavorable conditions and diseases.

The need of the vine in fertilizer is determined by different methods:

- by visual inspection through changes in the color of leaves, their shape, the growth rate and ripening of shoots (by so-called morphological and biological characteristics);
- by applying the method of functional diagnostics of leaves by chemical composition;
- by means of chemical analysis of soil.

On this basis the nutrition system is selected, which includes the required types of fertilizers in combination with pesticides and other means of plant protection. But moderation is vital since irrational and excessive introduction of certain fertilizers causes irreparable harm to the vineyard. This results in inhibition of shoots growth, reduces yielding capacity and even leads to a banal chemical burn of leaves and berries.

Despite the widespread opinion that the vine must “suffer”, it is necessary to realize that to ripen a high quality harvest a plant has to get enough nutrients. For this very reason, based on the quality indicators and soil peculiarities as well as taking into account the unique nature of different grape varieties, the



“Cote Rocheuse” experts perform additional fertilizing with macro- and microelements under the annual plan of measures for plant protection. This has a positive effect on the quality of grape and vine health.

It can be said with confidence that without the knowledge of the fertilizers classification it is impossible to use them adequately in viticulture. One should have a clear understanding of which macro- or microelement, in which amount and by what method must be used to compensate its deficiency.

There is a huge variety of fertilizers. Let us review the basic ones used in viticulture.

On the first hand, genealogically all fertilizers fall into organic and mineral.

Organic fertilizers include substances of vegetable and animal origin (humus, compost, manure, peat, bone meal, plant residues).

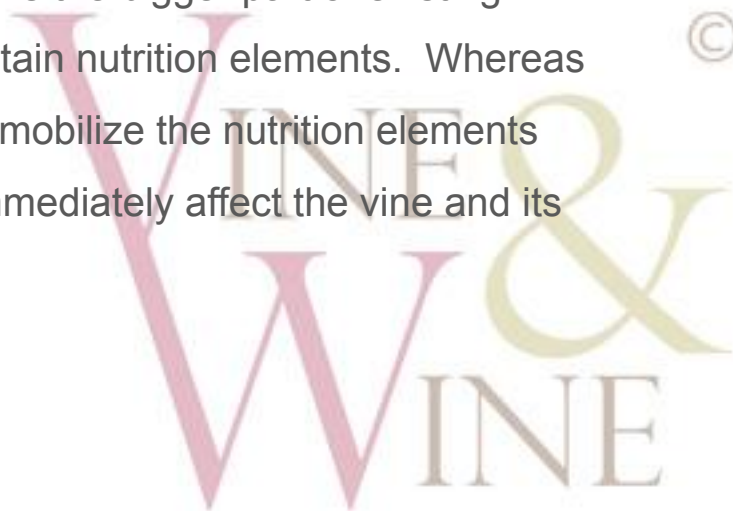


Mineral fertilizers are inorganic compounds with a high concentration of various mineral salts required for the nutrition of plants.



Mineral fertilizers which include one element are called simple while complex fertilizers, respectively, include a combination of two or more nutrient elements. The basic macro elements are nitrogen (N), phosphorus (P) and potassium (K), but there are also many other mineral elements that plants need in different quantities.

On the second hand, according to the effect they have on the soil and the nutritional regime of plants, direct and indirect fertilizers are distinguished. The group of direct effect fertilizers, which is the bigger part of existing fertilizers, includes those that actually contain nutrition elements. Whereas indirect fertilizers improve soil properties, mobilize the nutrition elements which it already contains and thus they immediately affect the vine and its yield capacity.



The easiest method of classifying fertilizers is based on their physical state: solid, liquid, and in the form of suspension.

With respect to structure there are powdered, crystalline and granular fertilizers.

Depending on the soil and plant requirements, as well as the type of fertilizer there are several ways of their introduction:

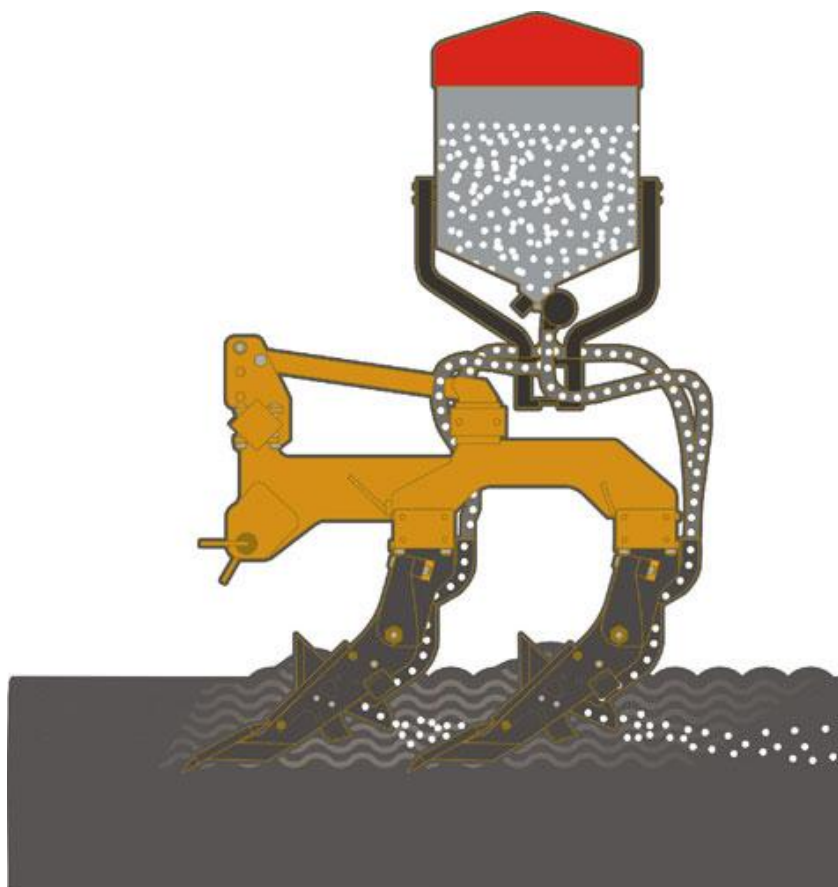
- Overall application (placement of fertilizers for so-called deep plowing);
- Locally-ribbon placement (introduction of substance into the soil to the depth of the roots position);
- Leaf fertilizing (spraying over the leaf mass).

The selection of machinery and equipment used for this purpose is based on the method of fertilizer introduction. Spreaders and seeders are most suitable for fertilizers spreading.



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For local introduction a subsoil cultivator of fertilizer is used.



For liquid fertilizers it is necessary to use the mounted or trailed sprayers of different types.



Periods, dosage rates and the frequency of fertilizers introduction depend on numerous factors: climatic conditions, an assortment of grape varieties, soil properties and etc. The basic fertilizers are introduced into soil in spring and autumn. In autumn slow-moving fertilizers are spread, they are fixed in the soil layer into which they were introduced (manure, peat, phosphorus-potassium fertilizers). In spring nitrogen fertilizers are introduced, besides, plant-root fertilization is carried out. The depth of fertilizer introduction should correspond to the depth of the vineyard roots main mass placement, i.e. approximately 25-45 cm. During vegetation development leaf fertilizing is carried out. The latter is spraying plants over the leaf mass with aqueous solutions containing macro and microelements. In addition to this, they can be combined with prophylactic spraying of grapes in order to prevent diseases. Dosage amounts, the ratio of nutrients and types of fertilizers are determined on the basis of biological characteristics of the grape variety and availability of nutrient elements in soil. Periodicity of fertilizers introduction depends on the indicators of soil capabilities.

Hence, the usage of fertilizers in the vineyard requires integrated work of highly qualified professionals who carry out diagnostics of the macro- and microelements deficiency, the accurate selection of fertilizers types and their direct introduction into soil or over plant.

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