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The Importance of Chemicals in the Development and Fertility of Plants

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Abstract: This article talks about the importance of chemicals in the development of plants. Also, the importance of phosphorus for plants, its amount and forms in the soil are highlighted.

Keywords: the importance of chemicals, the importance of phosphorus for plants, the development of phosphorus in plants.

Phosphorus is one of the most important elements after nitrogen in plant nutrition. Plants absorb phosphorus mainly in the form of anions of orthophosphate knelot (H2 PO4). They can absorb phosphorus from salts of metaphosphate (H3PO3) and pyrophosphate acids, as well as phosphorus from some organic phosphates - phytglucose phosphates and others. Orthophosphoric acid, a tribasic acid, dissociates at pH 7-8 and below, releasing one or two N+ ions and forming H2 PO4 and HPO42 ions, which are absorbed by plants.

In plants, the most important role is played by high molecular complex substances consisting of organic compounds of phosphorus, nucleic acids, aeotic bases, carbohydrate molecules (ribose or deoxyribose) and phosphoric acids. They participate in the most important processes of the life of organisms - protein synthesis, growth and reproduction, and the transmission of hereditary characteristics from generation to generation. Nucleic acids together with proteins form nucleotides, which participate in the construction of the cytoplasm and nucleus of cells. A large amount of phosphorus in plants is part of phytin - a reserve substance of seeds, this substance is used as a source of phosphorus element during plant growth. Phosphorus is also part of vitamins and many enzymes.

Phosphorus in energy metabolism in plant cells. plays an extremely important role in the processes of exchange of various substances. It also participates in carbohydrate and nitrogen exchange, photosynthesis, and respiration processes. Phosphorous compounds rich in energy are especially important for the implementation of synthetic processes, among which adenosine triphosphate acid (ATF) plays a key role. The lack of phosphorus in plants is especially noticeable during their young germination, when the assimilation characteristics of the not yet well-developed root system are low. During this period, the negative effect of phosphorus deficiency cannot be corrected even by feeding with more phosphorus. The plant absorbs phosphorus the most during the period of intensive growth of its vegetative organs, therefore, the initial periods of growth are a critical period in relation to phosphorus nutrition. Therefore, it is extremely important to provide plants with easily soluble phosphorus at the beginning of vegetation.

The amount of phosphorus (P2O5) in various soils ranges from 0.03 to 0.2%, and in the arable layer its total reserve is from 100 to 6000 kg per 1 ha.

2. During the growing season, plants consume an average of 20 to 60 kg of R2O5 from 1 ha of soil, that is, much less R2O5 than nitrogen and potassium. Phosphorus in the soil is replaced by manure and residues of roots and stems. There is no source other than phosphorus fertilizers to fill the phosphorus reserves in the soil.

Phosphorous fertilizers are divided into three groups depending on their solubility and plants:

1. Fertilizers that dissolve well in water - simple superphosphate and double superphosphate. 2. Fertilizers that are less soluble in water, but soluble in weak acids - presnpitate, tomashlak, thermophosphates, defluorinated phosphate... 3. Fertilizers that are insoluble in water, completely soluble only in strong acids - phosphorite flour, bone meal.

Superphosphate. Simple superphosphate is obtained by treating crushed apatite or phosphorite with sulfuric acid. Hardly soluble phosphates crystallize and water-soluble monocalcium phosphate Ca (H2PO4) and water-insoluble gypsum Sa5S>4 are formed:

$2\ Ca_5\ F\ (PO_4)_3 + 7H_25O_4 + 3H_20 = Ca\ (N_2PO_4)_2\ H_2O + 7CaSO_4 + 2\ HF$

$Ca_3(PO_4)2 + H_2SO_4 + H_2O = Ca(H_2PO_4)_2\ H_2O + -2Ca5O_4$

Ordinary superphosphate obtained from apatite contains 19-20% phosphorus, and when obtained from phosphorites, it contains 14-16% phosphorus (calculated as P2O5).

Normal superphosphate is mainly released in granular form, the size of the grains is 2-4 mm.

Double superphosphate differs from ordinary superphosphate in that it does not contain gypsum, therefore the amount of P2Oa in it is more 42-49%. Phosphorus in it is water-soluble calcium morophosphate Ca(H2PO4)2 H2O and a small amount (4, 5-5.7 %) is in the form of free phosphoric acid.

Double superphosphate is prepared in granular form. Its chemical and physical properties, use and effectiveness are similar to ordinary superphosphate.

When applying superphosphate as the main fertilizer, it should be buried with a plow, in this case, the fertilizer should be in a deep and always moist layer of the soil, where the main part of plant roots in the soil is located.

As a result of chemical digestion, superphosphate is almost completely fixed in the place of application and moves very slowly in the soil.

In the first year, plants do not use it, superphosphate phosphorus remaining in the soil is partially absorbed in subsequent years.

Precipitate calspy diphosphate (Ca HPO4 x 2H2O) contains 27 to 35% P2O5. Precipitated phosphorus does not dissolve in water, but dissolves in ammonium citrate and is well absorbed by plants. Fertilizer has good physical properties. Precipitate all It can be used as the main fertilizer for various crops in the soil.

Thomas slag is a by-product produced when phosphorus-rich cast iron is reprocessed in Thomas's alkaline method and turned into iron and iron.

Tomaszlak is a heavy, fine powder of dark color. It contains 14 to 20% P2O5. This fertilizer can be used as a basic fertilizer on all soils.

Phosphorite flour is obtained by grinding phosphorite until it becomes flour. This fertilizer is not hygroscopic, does not clump. The amount of P2O5 in its composition is around 19-30%. Phosphorite flour is the cheapest phosphorus fertilizer.

This fertilizer is most effective when applied to all autumn crops, as well as grass-demanding crops - turnips, potatoes, corn and beans. The more phosphorite is added, the longer its effect will be.

Potassium plays an important physiological role in the life of plants. Potassium is not part of any organic compounds in plants. Potassium has a positive effect on the intensity of photosynthesis and oxidation processes and the formation of organic acids in plants, participates in carbohydrate and nitrogen metabolism.

When there is a lack of potassium, protein synthesis in the plant slows down, as a result, nitrogen metabolism is completely disrupted, and the conversion of simple carbohydrates into more complex carbohydrates is stopped. Potassium enhances the flow of sugars from leaves to other organs, increases the activity of enzymes involved in carbohydrate metabolism, including sucrase and amylase.

Under the influence of potassium, the cold resistance of plants increases, which is due to the high amount of sugars and the increase of osmotic pressure in the cells.

When sufficiently fed with potassium, plants are resistant to various diseases. Potassium contributes to the development of mechanical elements, tube-like tufts and lube fibers, therefore it has a positive effect on the growth of stems and the quality and quantity of flax and cotton fibers.

When there is a lack of potassium, the development of reproductive organs stops, combs and primary flowers do not develop, the grain is wasted and the germination rate decreases. Potassium is more abundant in vegetative organs compared to reproductive organs!

The amount of potassium (K2O) in soils varies from 0.5 to 3%, depending on their quality. In the arable layer of the soil, the reserve of K2O corresponds to 50-75 thousand kg per 1 ha of land, but the main part of potassium (98-99%) is in the form of compounds that are insoluble in the soil and difficult for plants to absorb.

It absorbs water-soluble potassium in the form of various salts in its solution, but the amount of such potassium is very small.

Exchangeable potassium is the main source of plant nutrition. The reason for the easy absorption of exchangeable potassium by plants is its easy transition to solution when it is exchanged with other cations and its good absorption by plants.

Potassium chloride - KC1 contains 53.7-60% K2O.

Potassium chloride is found in salt minerals. It is obtained from sylvinite by separating NaCl with KC1. According to the flotation method, surfactants (amines) are added to separate KC1 from NaCl in sylvinite, they are adsorbed only on the surface of KC1 grains, and #S1 crystals sink.

Potassium chloride is a basic potash fertilizer that can be used on any soil and for all crops.

40% potassium salt is obtained by mechanically mixing potassium chloride with crushed sylvinite or kainite. This fertilizer is very effective for the root crops of sunflower and horseradish, which like sodium and are not very sensitive to chlorine.

Potassium sulfate - K2SO4 contains 46-50% K2O. Small crystalline salt with a gray appearance, soluble in water. It is obtained by separating K2SO4 from natural sulfated potassium salts. This fertilizer is not hygroscopic, does not clump. It can be used on any soil and all crops.

Ash element The elements preserved in the ash that falls after the burning of the plant is called the ash element. K, P, Na, Ca, Mg elements are found in ash.

Potassium in ash is mainly in the form of potash (K2CO3). This fertilizer is the best fertilizer for all crops. But ash is considered an alkaline fertilizer and works well on acidic soils. 500-600 kg of ash is applied per hectare.

Sylvinite m KC1 + n NaC1 contains 12-15% K2O and 34-38% Na2O and 52-55% C1. In appearance, it is a mixture of large, various colors - white, pink, brown and blue crystals, it

dissolves well in water. It is slightly hygroscopic. Sylvinite is applied as the main fertilizer during autumn plowing. In this case, a large part of chlorine is washed into the lower layers of the soil. All potash fertilizers are well soluble in water. When placed in the soil, they quickly dissolve and interact with the soil absorption complex (TSK).

K

(TSK) + 2 KCL → (TSK) K + $CaCL_2$

← Ca

Potassium and other cations (Na, Mg 2+) included in potash fertilizers are absorbed into the colloidal part of the soil, while chlorine remains in the soil solution and is therefore easily washed away. The coefficient of use of potassium pin g in mineral fertilizers is 50-60% medium and heavy mechanical soils, potash fertilizers should be applied in autumn during plowing.

In light soils, especially in areas with a lot of rainfall, it is better to apply potash fertilizers with a cultivator in the spring (in sandy and loamy soils with low absorption capacity.) All potash fertilizers are physiologically acidic. are salts.

Potassium fertilizers are not effective in saline soils, where there is usually a lot of mobile potassium, their application causes the soil to become more salinized. Potassium fertilizers are used in light sandy and sandy soils, gives the best results. On gray soils, which are better supplied with potassium, it should be applied only during irrigation to crops that require a lot of potassium, such as sugar beets, corn, sunflowers, potatoes, and vegetables.

fertilizers contain two or three nutrients in one chemical compound.

Complex mixed or combined fertilizers include complex fertilizers (nitrofos, nitrofoska, nitroammofos, nitroammofoska, etc.) obtained in a single technological process and combining two or three nutrients in one grain in the form of various chemical compounds.

Mixed fertilizers are a mixture of simple fertilizers.

Ammofos - NH4H2PO4. The fertilizer contains 11-12% N and 46-50% P2O5. This fertilizer is obtained by neutralizing ammonia under the influence of phosphoric acid: NH3 + H2PO4 = NH4H2PO4 is given as the main fertilizer to agricultural crops in early spring or during planting.

Diammophos- (NH4)2HPO4 Contains 18% N and 50% P2O5. This fertilizer is obtained by saturating phosphoric acid in ammonia. 2NH3+H2PO4 =(NH4)2HPO4 is the disadvantage of these fertilizers. they have much less nitrogen than phosphorus in Karaganda. Therefore, in order to obtain N and P2O5 in normal proportions, it is necessary to add a certain amount of nitrogen fertilizer.

Nitrofos and nitrofoskas are obtained by decomposing phosphorus with nitric acids. Nitrophos contains elements N and P, and if KC1 is added to them, they are called nitrophos. They may contain N-10-17%, P2O5-8-30% and K2O12-20%.

Nitroammophos and nitroammofoskas are obtained by neutralizing a mixture of nitric and phosphoric acids with ammonia.

The fertilizer based on monoammonium phosphate is called nitroammophos, and the one with potassium is called nitroammofoska. The amount of N in the composition can be 10-30% and the amount of P2O5 in the range of 27-14%. The total amount of N, P and K in nitroammophoska is 44 to 62%.

REFERENCES

1. Abdullayev K.A. Soils of Uzbekistan. T:, 1977
2. Boboho'jayev.I. Uzokov P. Composition, properties and analysis of soil.
3. Boboho'jayev I. Uzokov P. "Soil science" T: Labor 1995.

4. Bohodirov M. Rasulov A. "Soil science" T: Teacher 1975.
5. Kaurichev I.S. Pochvovedenie M. Kolos 1989.
6. Peyve Ya. V Biochemistry pochv M. Selkhozgiz 1949.
7. Rasulov .M. Irmatov I. Soil science, with the basics of farming T. Teacher 1980
8. Tursunov L. Soil physics T. Labor 1988.
9. Land Code of the Republic of Uzbekistan T.1998.
10. Law of the Republic of Uzbekistan "On Land Cadastre" T: "Program for deepening economic reforms in agriculture in the period 1998-2000." T.1998
11. Gafurova L.A. Makhsudov Kh.M. Adel M.Yu Biological activity of gray soils formed in eroded Neogene deposits T. Uzbekistan 1999.
12. Kachinsky N.A. Mekhanicheskiy i mikroaggregatnoy sostav pochvi M. 1958.