



## IMPROVEMENT OF AGROBIOLOGICAL STRUCTURES AND STRUCTURE-FORMING PROPERTIES OF SIEROZEM SOILS

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### ANNOTATION

It was revealed that in the conditions of sierozem soils of the Fergana region, in order to increase the humus content, it is necessary to switch crops of lucerne or leguminous crops to crop rotation.

In the Fergana region of the Republic of Uzbekistan, 95% of the land during the cultivation of cotton, wheat, corn is irrigated during the growing season from

3 to 8 times during the growing season, which requires 3500 to 6500 m<sup>2</sup> / ha of water. As a result, the reserves of humus and basic nutrients have sharply decreased. For growing cotton and wheat applied by farms N; P<sub>2</sub>O<sub>5</sub>; K<sub>2</sub>O became insufficient, since repeated irrigations gradually lead to a deterioration of humus reserves from year to year, decreased by 33-55% compared to 1950 (Imamaliyev, 1978) old-growing hectares when plowed at a depth of 28-35 cm for a long time led to a sub-arable layer in the so-called "plow sole" (Mukhammadzhanov, 1962) for the destruction of this layer, the author recommended deep tillage with the help of rippers (Mukhammadzhanov, 1978). Further, the author points out that under the arable layer of the soil is very poor in organic matter, therefore the number of soil microorganisms has sharply decreased, to accelerate them, manure and other organic matter (green manure) must be introduced. According to M. Mukhammadzhanov, I.S.Sulaimonov (1975), with prolonged sowing of cotton (monoculture), microbiological processes in all soil horizons decreased, the number of various groups of microorganisms sharply decreased due to lack of food reserves. With such a long monoculture, according to the data of Z. Tursunkhadzhaev (1975), the number of perennial and annual weeds increases several times, and the incidence of cotton wilt sharply increases. The opinion is expressed that the fungi *Penicillium*, *Aspergillus*, *Fusarium*, *Trichoderma* predominate in many soils, the reason for this is their large adaptation range. Some fungi from the lower soil horizons are more resistant to increased carbon dioxide concentrations.

Soil fungi are resistant to higher CO<sub>2</sub> and lower O<sub>2</sub> concentrations than aerobic bacteria and actinomycetes (Babich and Stetzky, 1974). Microorganisms form various gaseous substances in the soil such as CO<sub>2</sub>, nitrogen oxides, ammonia, hydrogen sulfide, hydrogen, methane, ethane, butane, propane, ethylene, propylene, butene and hydrocarbon gas. These gases, which microorganisms are capable of forming, they can and change. The surface of the pores of capillaries and aggregates is saline with microorganisms, which are able to completely intercept diffusing gases (Zvyagintsev, 1973).

The microbiologist must solve the problems of studying the physiology of microorganisms and the biochemistry of soil zoocenoses from which one can expect a great deal of experimental material on the enrichment of the soil, albeit in part, with molecular nitrogen.

Our studies show that after plowing 3-year-old lucerne (after the second mowing), then sowing corn (lucerne -2.5 years + corn for silage) when these plants stayed in the soil, the humus content reached 1.46%, while at the beginning of the experiment, it was 1.01 % i.e. humus increased by 0.45%.

It should be noted that in the original soil before sowing lucerne there was a lower humus content on the subsoil (31-50 cm) of the soil, 0.60%. Consequently, in increasing humus, not only lucerne has a positive effect, but also sowing corn on silage at a plant density of 70 thousand / ha. In the zone of development of plant roots, an increased number of microorganisms is observed in comparison with the soil of the control variant, i.e. microorganisms do not mechanically touch the root system, but also penetrate the root tissue.

Consequently, when the microbial mass interacts, adhesives are formed, which were transformed during treatment with calcium salt in water-resistant complexes, i.e. in the experimental variants, the number of different groups of organisms increased sharply.

The number of microorganisms in the different levels of fertility thousand / ha.



Option name	Horizon sm	2017	2018	2019
		12 april	10 june	15 july
1-hop plant (control)	0-30	10,3	15,7	17,1
	31-50	7,4	13,2	7,6
2-lucerne + corn	0-30	23,6	30,2	19,6
	31-50	16,8	20,0	12,3
3 year old lucerne	0-30	29,3	40,2	22,5
	31-50	19,6	14,6	14,0

The content of carbon and nitrogen in the soil at a 3-year standing of lucerne increased by 0.39% compared with the control variant, while the combined sowing of lucerne with cereals increased by 0.59%, these indicators for the nitrogen content were more than 0.08 and 0.22 %. It is known that the root system of plants dramatically improves the water-physical and microbiological properties, in addition, they enrich the soil with mineral elements, as in the organs of plants and in the roots there are more than 22-32 chemical elements.

Agrochemical analyzes have shown that perennial forage grasses within 2-3 years increase the carbon content by 0.39-0.59%, and nitrogen substances by 0.018-0.022%. Within 2 years, lucerne accumulated 7901 kg / ha of nitrogen, lucerne + legumes 886 kg, the amount of nitrogen in the rhizosphere of lucerne root - 273.3 kg / ha, lucerne + cereal grain -265.0 kg / ha dry weight. Many years (since 2004) of stationary experience show that constant sowing on the same area of cotton - winter wheat without the introduction of NPK yielded 16.8 c / ha of cotton, while at a dose of NPK -160: 120: 60 kg / ha the yield of cotton of the variety C-6524 amounted to 42.8 centners / ha and with a two-year state of lucerne 43.9 centners / ha (without NPK).

Thus, the foregoing suggests that lucerne in the irrigated soils of the Fergana region of two and three years of standing give soil enrichment of 35-45 t / ha with organic matter or save 250 kg / ha of nitrogen fertilizers.

## LITERATURE

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## Feedback

An article by the teacher N. Khodzhibolaeva On the topic "Improving the agrobiological structures and structure-forming properties of serozem soils" conducted in 2013-2016. in field stationary experiments it was revealed that in order to increase the humus in crop rotation plants of serozem soils, the sowing of lucerne of two and three years of standing should be passed. The best result was obtained from a three-year standing of lucerne, which left 0.29% of humus in the soil, sowing cotton after lucerne increased the yield by 12.9 c / ha.

We found that the number of microorganisms sharply increased when sowing lucerne on a three-year stand compared to the control increased almost three times. The reason for this is the improvement of the air nutritional regimen on these variants.

The carbon nitrogen content in the soil at three-year-old lucerne increases by 39% compared to the control. A similar picture was observed for total nitrogen.

Agrochemical indicators were observed in experiments with perennial forage grasses. For example, nitrogen has increased by 0.018-0.022%. As a result of field experiments, the yield of cotton variety C-6524 reaches 44 c / ha.